H. SCHREIBER

Commande Volume – Tonalité
Gain ⩽ 80 dB Distorsion
Bruit < 50 µV

MONTAGES ÉLECTRONIQUE-RADIO-TV-Hi-Fi CIRCUITS INTÉGRÉS

SCHÉMAS ET CARACTÉRISTIQUES

2ème Édition

S.E.C.F.
ÉDITIONS RADIO

S. E. C. F.

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INTRODUCTION

Ce livre est une collection de schémas d'utilisation des circuits intégrés couramment utilisés dans le domaine «grand public». Ces schémas sont classés par ordre alpha-numérique (les lettres ont priorité sur les chiffres) du code d'appellation du circuit. Avec les valeurs des composants, ils indiquent certaines caractéristiques principales, gains en tension et en puissance, intensité d'alimentation, domaines de fréquence.

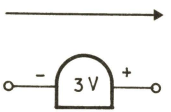
Avec les signes et symbôles habituels et courants, on utilise les abréviations suivantes :

AM Modulation d'amplitude
BF Basse fréquence
BLU Bande latérale unique
CAC Commande automatique couleurs
CAF Commande automatique de fréquence
CAG Commande automatique de gain
FI Fréquence intermédiaire (moyenne fréquence)
FM Modulation de fréquence
GP Gain en puissance
GV Gain en tension
HF Haute fréquence (30 kHz à 30 MHz)
LED Diode luminescente
Lim Limitation
UHF Fréquence supérieures à 300 MHz
VHF Fréquences de 30 à 300 MHz

Indices :

V_{CC}, V_{DD}, V_{SS}, V_S = Tension d'alimentation
V_{in}, i_{in} = Grandeur d'entrée
V_{out}, i_{out}, P_{out} = Grandeur de sortie
R_L = Résistance de charge

Symboles :



Entrée → Sortie

Tension continue, entre deux points de mesure

Tension alternative, entre deux points de mesure (volts efficaces, sauf précision contraire)

Intensités continues, dans un conducteur

Intensités alternatives, dans un conducteur (en valeurs efficaces)

Résistance d'entrée, en un point donné du circuit (par rapport à la masse)

Résistance de sortie, en un point donné du circuit (par rapport à la masse)

Dans le cas des amplificateurs BF, les valeurs de la résistance de charge et de la puissance nominale sont inscrites dans le symbôle du haut-parleur, ou répertoriées dans un tableau.

Tous les boîtiers sont représentés vus du dessus

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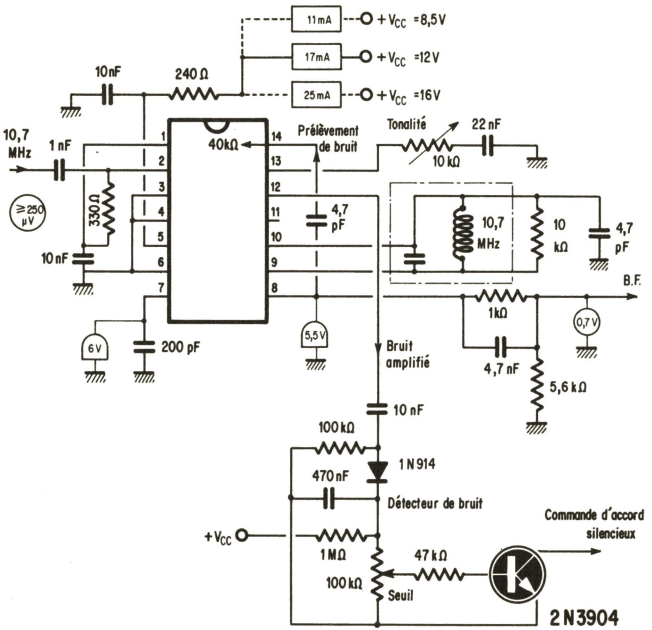
Amplif.-démodulateur F.M.

Réjection A.M. : 55 dB

Distorsion : 1 %

CA 3075

Fairchild _ R.C.A.



Amplif.-démodulateur F.M.

Réjection A.M. : 55 dB

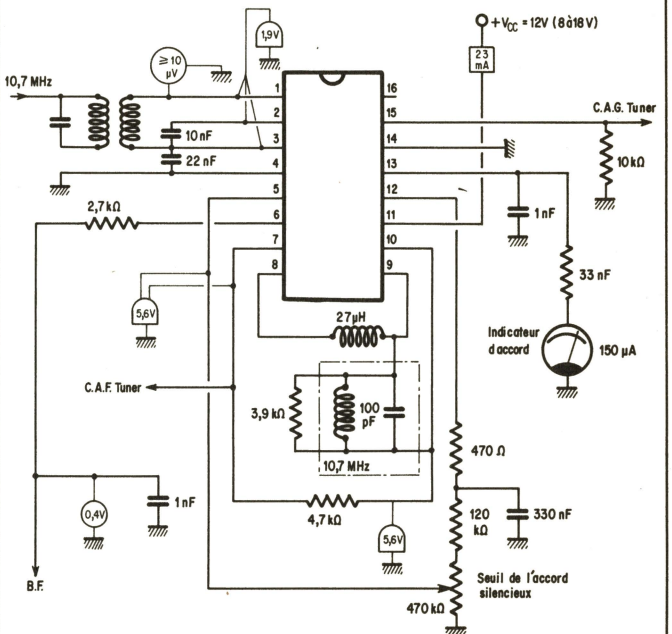
Rapport signal/bruit : 67 dB

Accord silencieux intégré

Distorsion < 0,5 %

CA 3089

R.C.A. _ R.T.C. _ Signetics

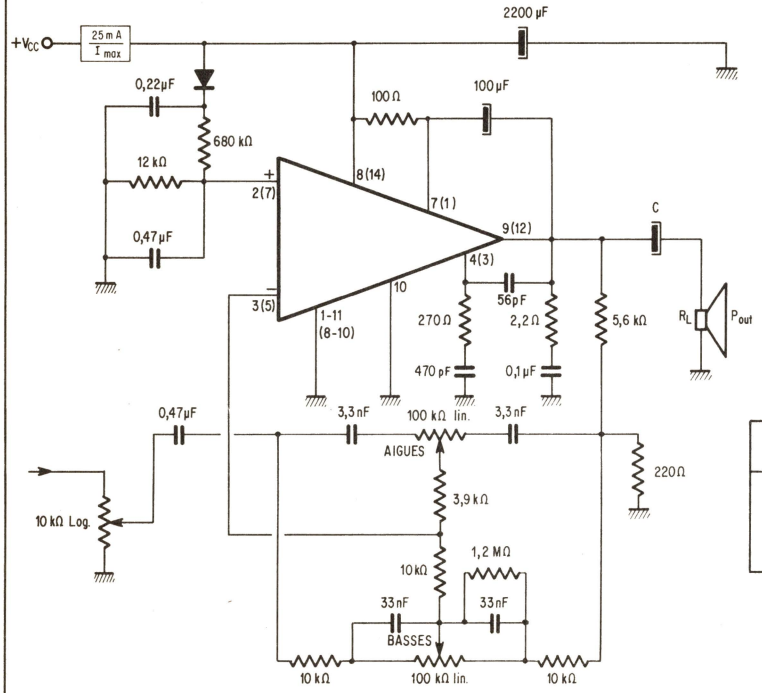


B.F. puissance 8 à 20 W

Gain en tension : 29 dB
Bruit à l'entrée : 4 µV
Bande passante 40 Hz à 20 kHz

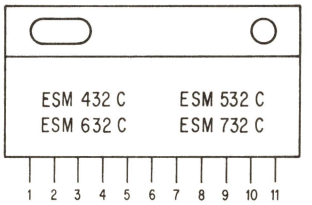
ESM 432, ESM 532, ESM 632, ESM 732

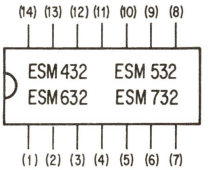
Sescosem | ESM 432 C = TDA 1111 SP



	ESM 532			
		ESM 432	ESM 632	ESM 732
V_{CC} (V)	30	28	24	14
R_L (Ω)	8	4	4	2
P_{out} (W)*	10	20	14	8
C (µF)	1000	2200	2200	3300
I_{max} (A)	0,6	1,1	0,8	0,9

* Pour 1 % de distorsion



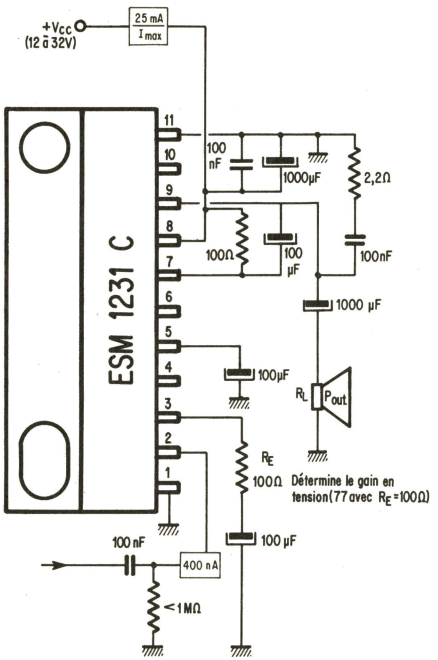


ESM 432 N, ESM 532 N, ESM 632 N, ESM 732 N : Comme ci-dessus, mais surmonté d'un radiateur.

B.F. puissance 8 à 20 W

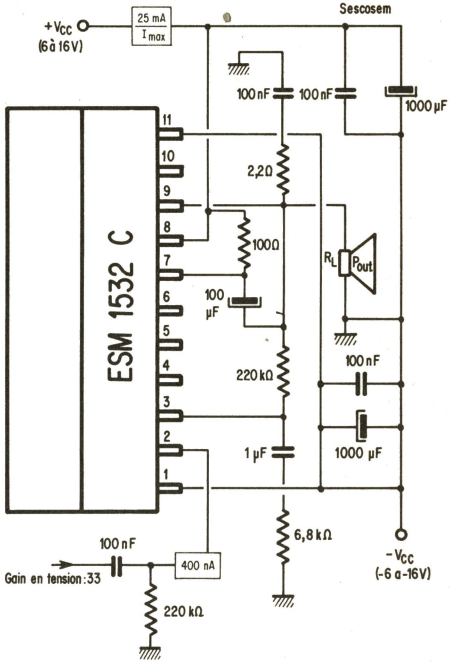
Bruit à l'entrée : 3 µV (ESM 1532 C)

ESM 1231 C
ESM 1532 C



V_{CC} (V)	R_L (Ω)	P_{out} * (W)	I_{max} (A)
28	4	20	1
24	4	14	0,8
14	2	8	1

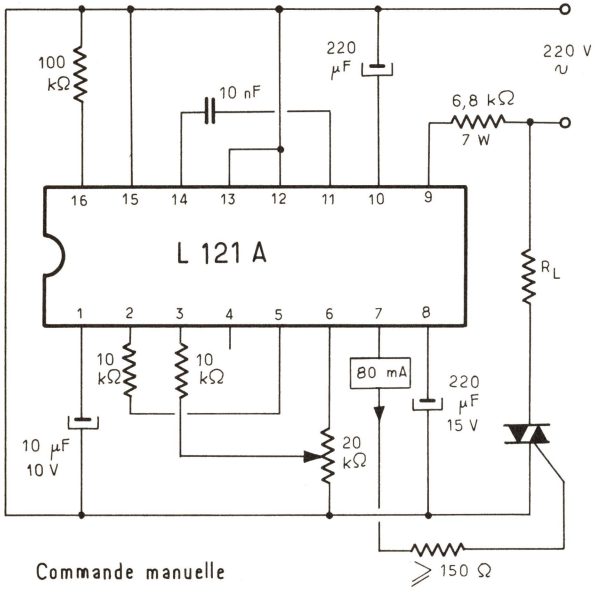
* Pour une distorsion de 1 %



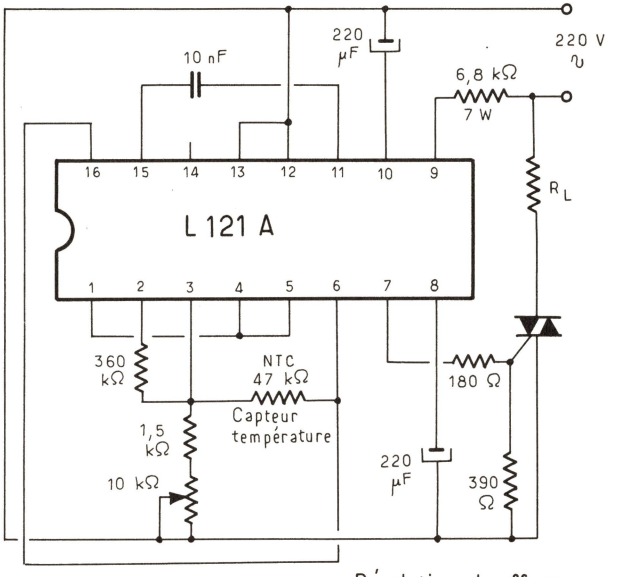
Commande triac

L 121 A

SGS



Commande manuelle



Régulation chauffage par tout ou rien

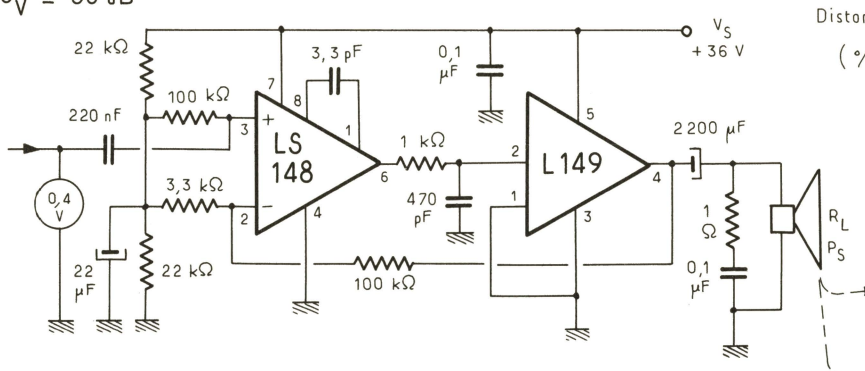
B.F. Puissance 12 à 20 W – L 149

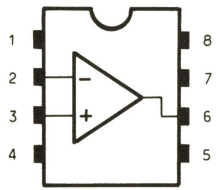
Amplif. opérationnel – LS 148

G_V = 30 dB

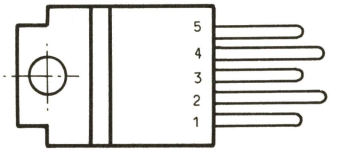
L 149
LS 148

SGS

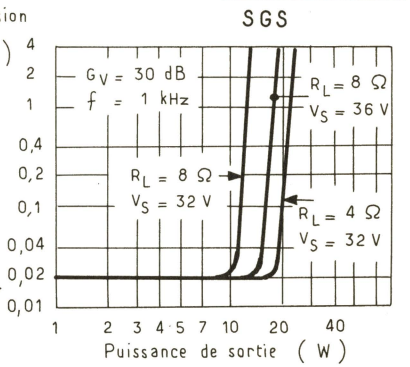


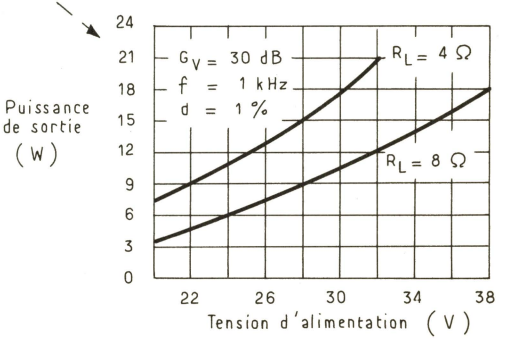


LS 148



L 149



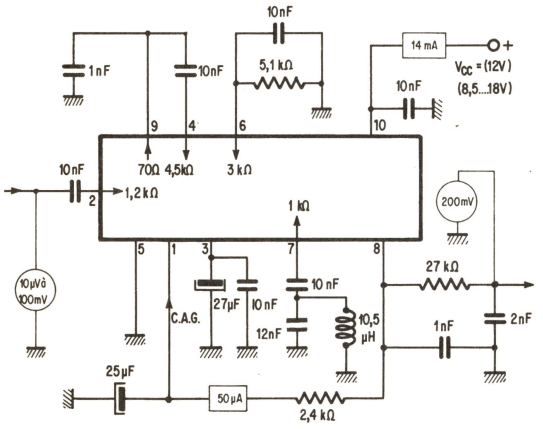


Amplif. et démodulateur F. I.

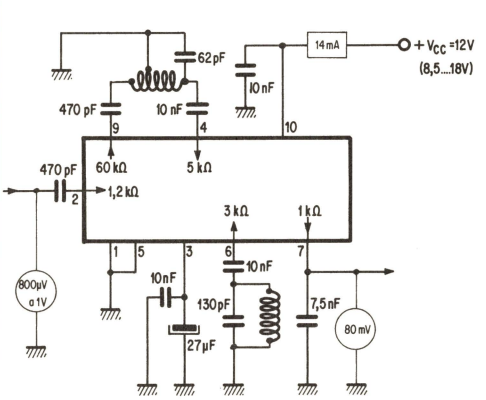
Distorsion : 1,5% en F.M., 5 % en A.M.

LM 373

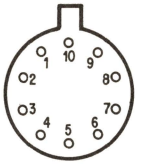
National Semiconductor

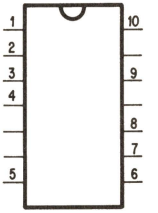


A. M. _ 455 kHz



F.M. _ 10,7 MHz



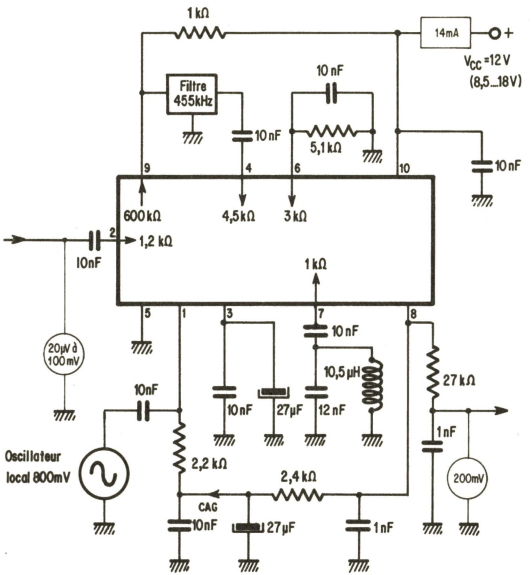


Radioréception A.M.

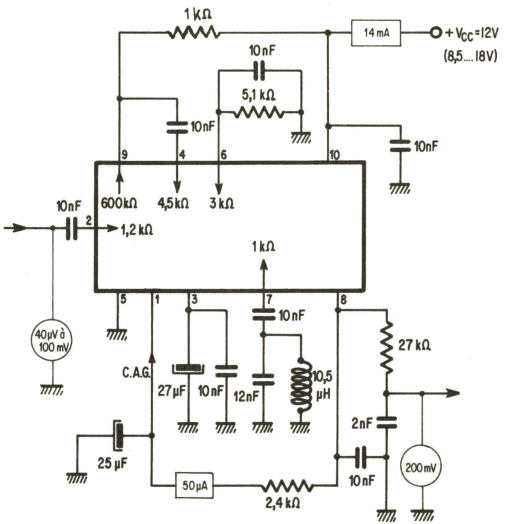
Distorsion 5 %
C.A.G. =70 dB

LM 374

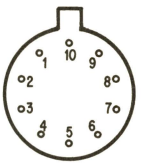
National Semiconductor

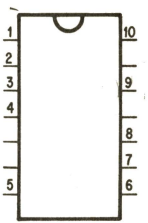


CONV.-AMPLIF-DÉMODULATION-A.M.



AMPLIF. FI.-DÉMODULATION-A.M.



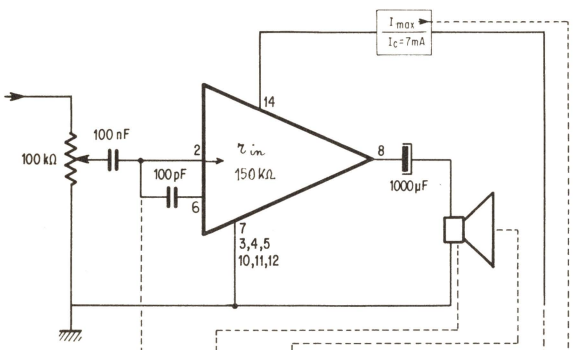


B.F. Puissance 1 à 4 W

GV = 34 dB

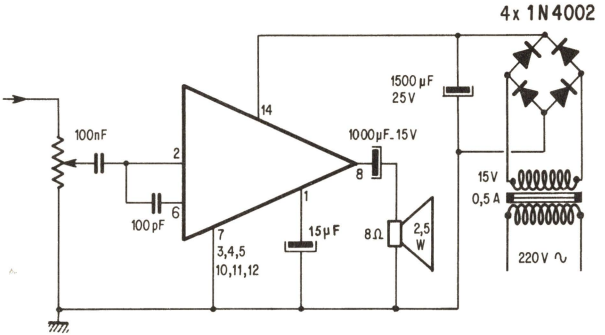
LM 380

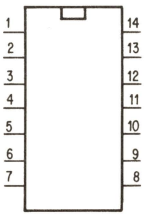
National Semiconductor

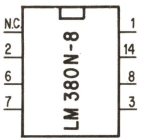


V_{in} (mV_{eff})	R_L (Ω)	P_{out} (W)	V_{CC} (V)	I_{max} (A)
80	4	1	9	0,22
100	8	1	12	0,17
100	4	2	12	0,33
120	8	2,2	15	0,23
140	16	1,8	18	0,16
160	16	2,7	22	0,18
160	8	4	22	0,32

Radiateur : surface cuivrée de 20 cm^2, soudée sur 3,4,5,10,11,12.







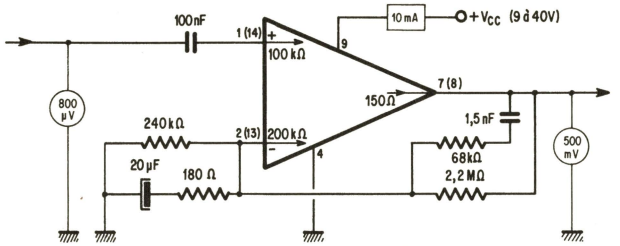
Sans possibilité radiateur,
$P_{out} < 2W$

Double préamplif. B.F.

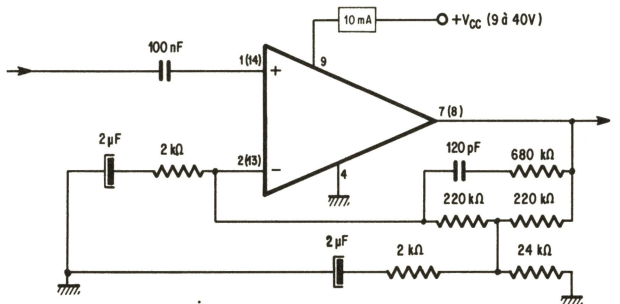
Bruit : 0,7 µV
Gain : 160 000 max.
Distorsion : 0,1 %

LM 381

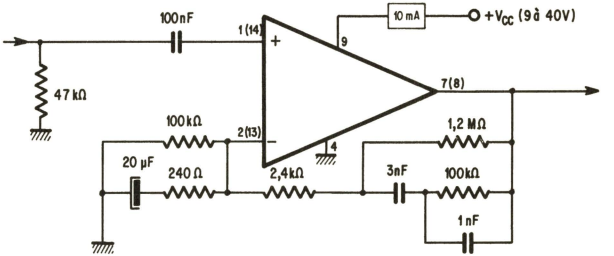
National Semiconductor
R.T.C. - Signetics



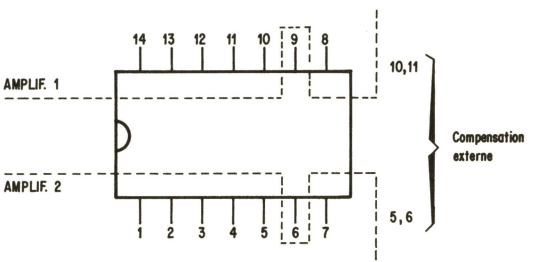
AMPLIF. LECTURE ENREG. MAGNÉTIQUE



AMPLIF. LECTURE ENREG. MAGN. - NAB



AMPLIF. LECTURE PHONO - TÊTE MAGN.

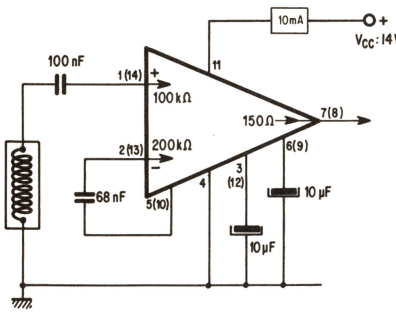


Double Préamplif. B.F.

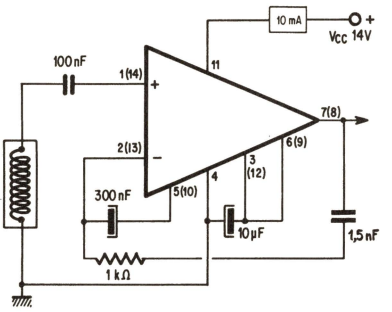
GV = 40 à 80 dB
0 à 75 kHz

LM 382

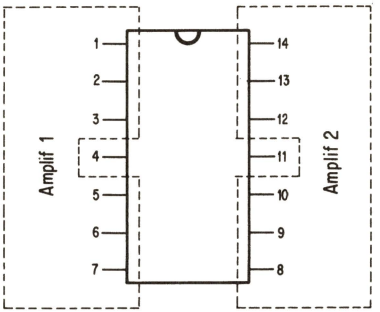
National Semiconductor
R.T.C. - Signetics

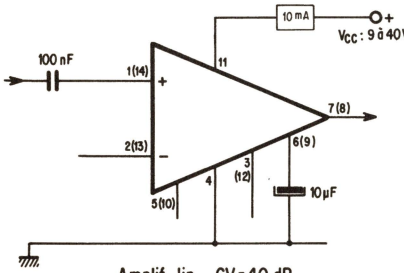


Amplif. lecture bande magn. (NAB)

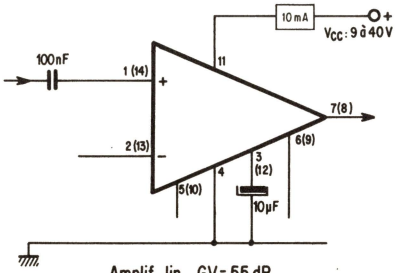


Préamplif. phono (RIAA)

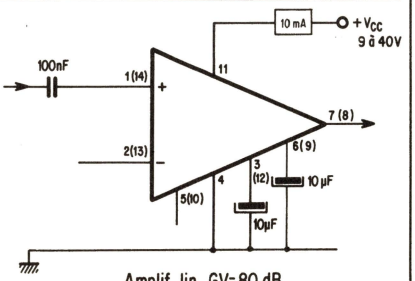




Amplif. lin., GV = 40 dB



Amplif. lin., GV = 55 dB



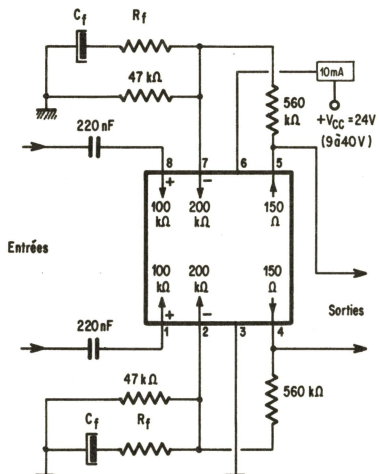
Amplif. lin., GV = 80 dB

Double préamplificateur

Facteur de bruit 1,6 dB

LM 387

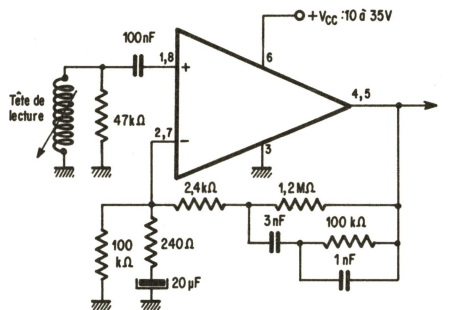
National Semiconductor
R.T.C. - Signetics



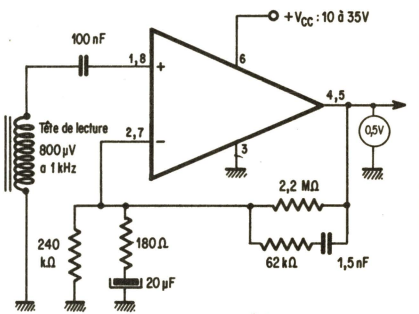
AMPLIF. LINÉAIRE

R_f détermine le gain en tension

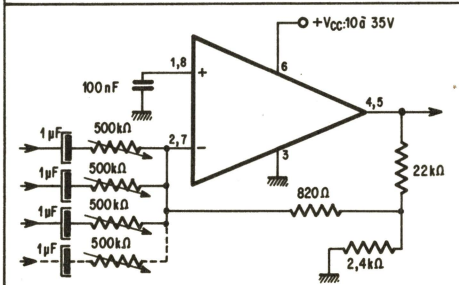
G_v	10	40	125	400	1200
R_f (kΩ)	∞	22	4,7	1,5	0,47
C_f (pF)	0	10	22	47	100



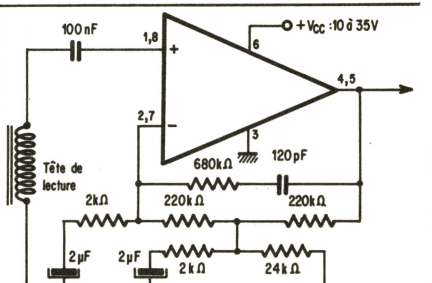
PRÉAMPLIF. PHONO



LECTURE BANDE MAGNÉTIQUE



PUPITRE MÉLANGE



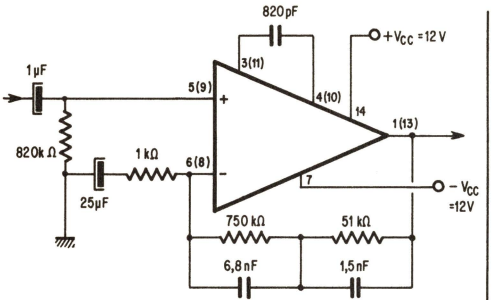
LECTURE BANDE MAGNÉTIQUE NAB

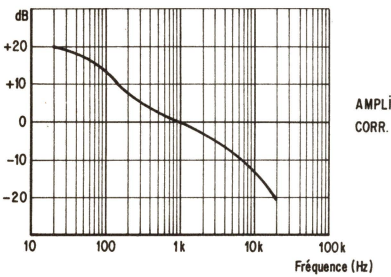
Double préamplif. B.F.

Gain 10 000 max.
Séparation 70 dB

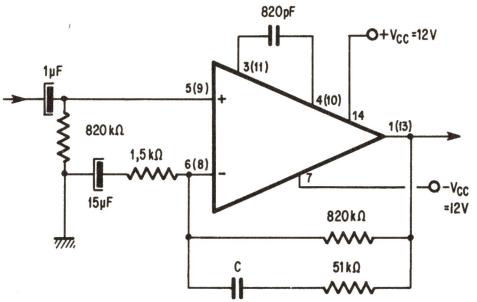
LM 1303

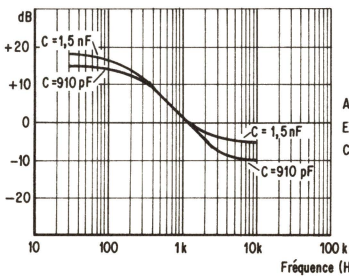
National Semiconductor
= MC 1303P Motorola



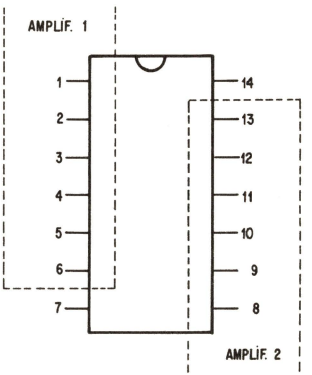


AMPLIF. PHONO
CORR. RIAA





AMPLIF. LECTURE
ENREG. MAGN.
CORR. NAB



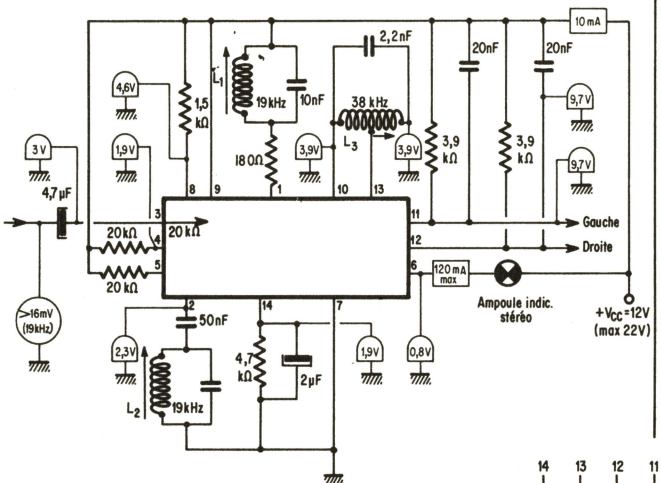
2,12 : Compensation Sortie

Décodeurs stéréo

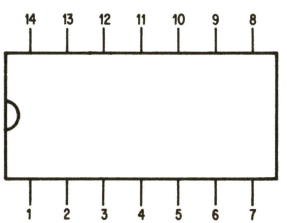
Séparation 45 dB à 1 kHz
Commutation automatique mono/stéréo
Distorsion: 0,5 %

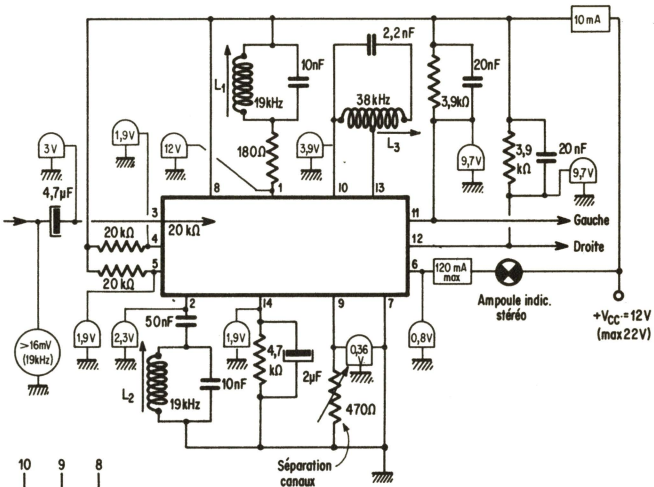
LM 1304 - LM 1305

National Semiconductor



LM 1304





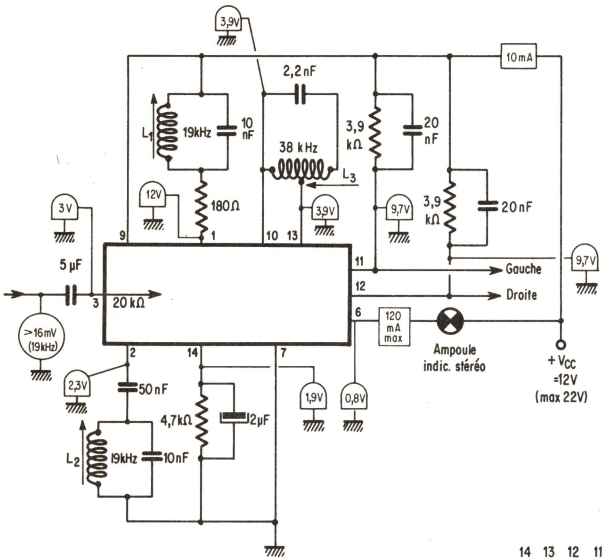
LM 1305

Décodeurs stéréo

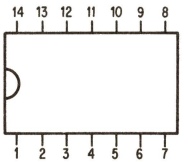
Séparation 45 dB à 1 kHz
Distorsion 0,5 %

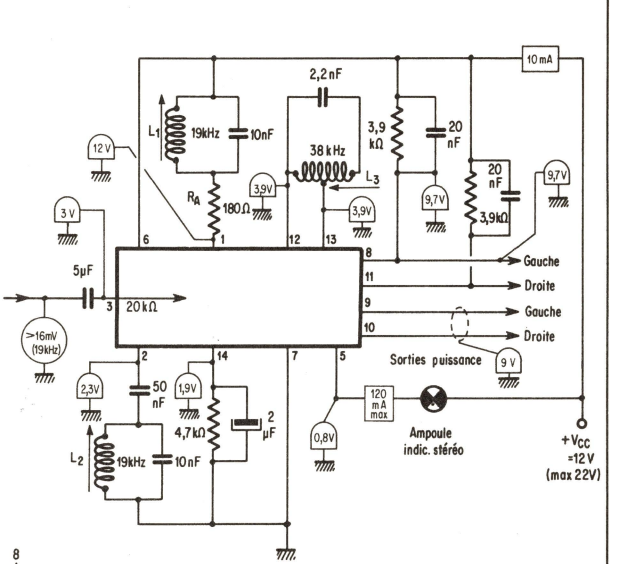
LM 1307-LM 1307E

National Semiconductor
= MC 1307 P Motorola
= SN 76110 Texas Instruments



LM 1307





LM 1307 E

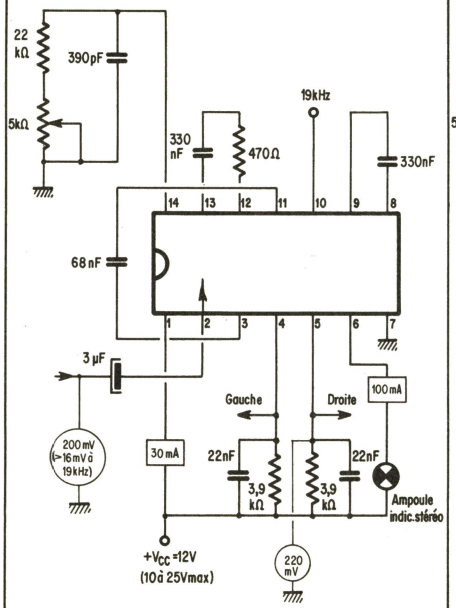
Décodeurs stéréo.

Verrouillage de phase
Séparation 40 dB à 1 kHz
Distorsion < 1 %

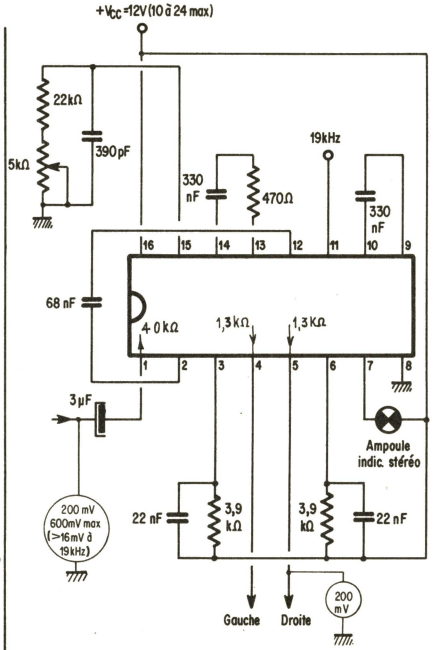
LM 1310-LM 1310 E
LM 1800

National Semiconductor

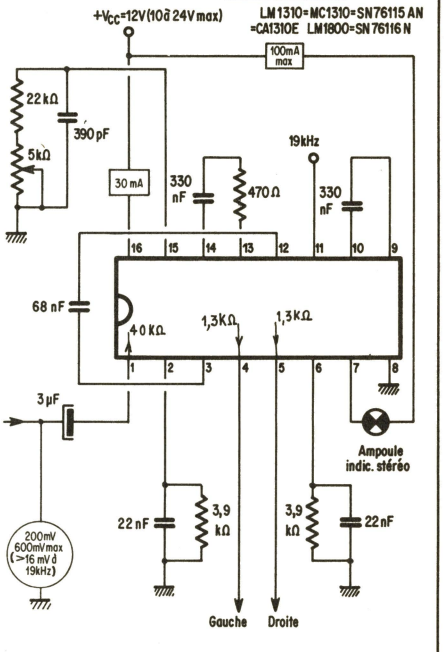
LM1310=MC1310=SN76115 AN
=CA1310E LM1800=SN76116 N



LM 1310



LM 1310 E



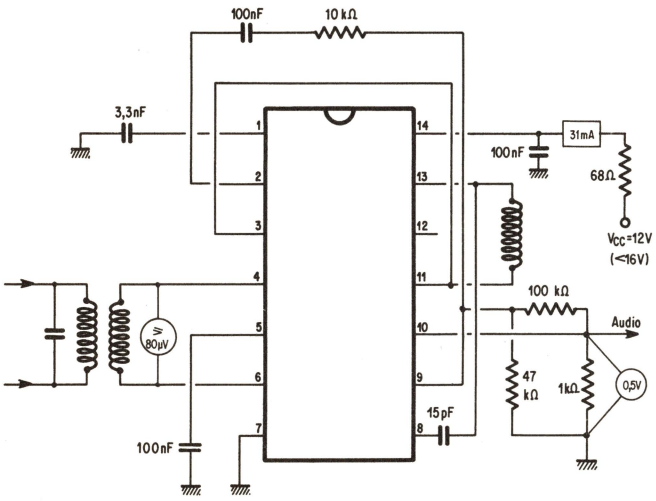
LM 1800

Amplif. démodulateur F.I. F.M.

LM 1351

National Semiconductor
=MC 1351 Motorola

Gain: 65 dB
Distorsion: 1 %
Réjection A.M.: 45 dB

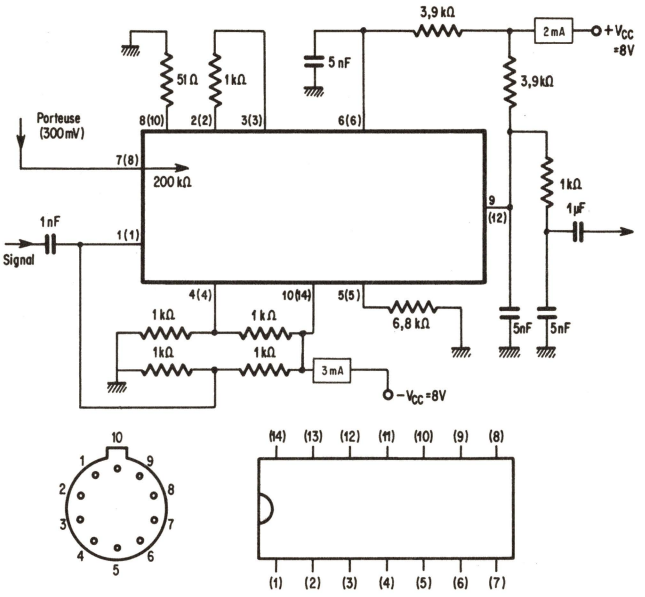


Détecteur de produit BLU

LM 1496

National Semiconductor
=MC 1496 Motorola

Bande 300 MHz
Gain: 3,5



Amplif. F.I TV (MC 1349)

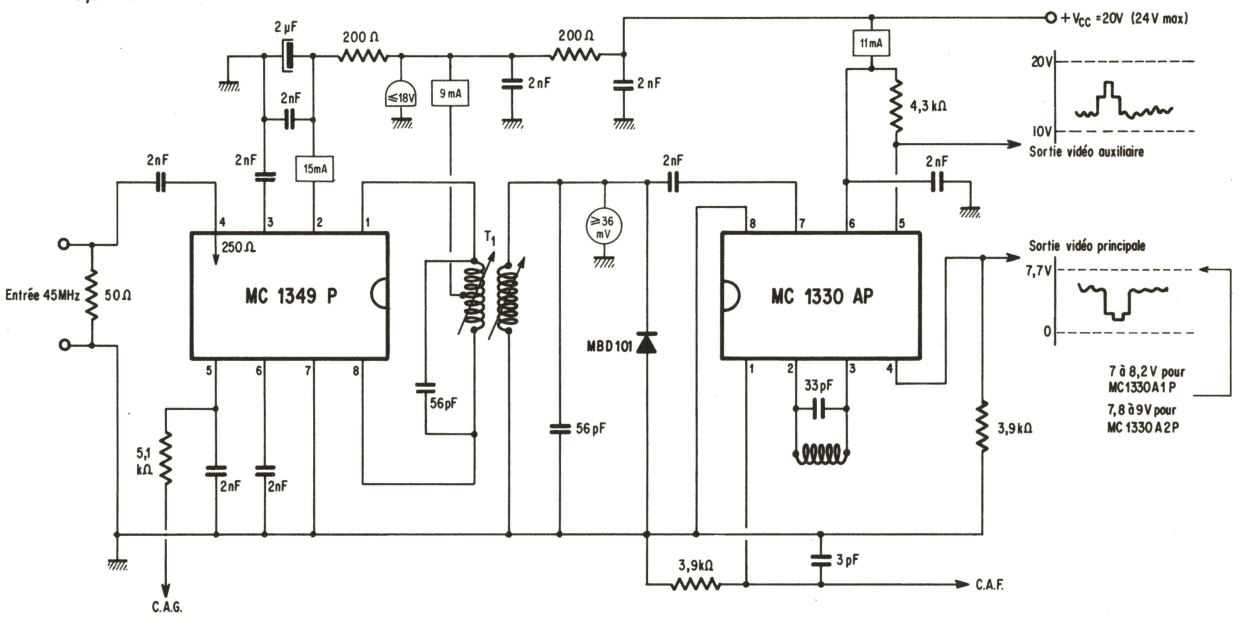
Gain: 60 dB - C.A.G. : 80 dB - Facteur bruit : 8,5 dB

MC 1330 AP
MC 1349 P

Motorola

Démodulateur vidéo (MC 1330)

Bande 10,8 MHz

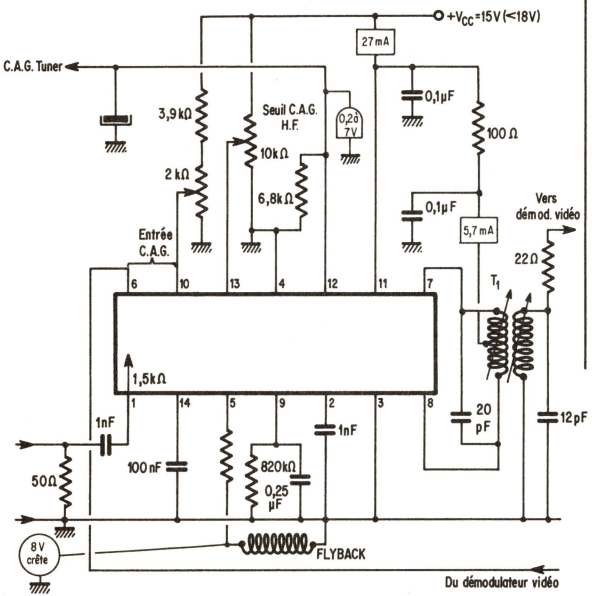


Amplif. F.I.

MC 1352
MC 1353

Motorola

Video-T.V.
Gain : 52 dB
C.A.G. Tuner croissante : MC1352=CA1352E
et décroissante : MC1353

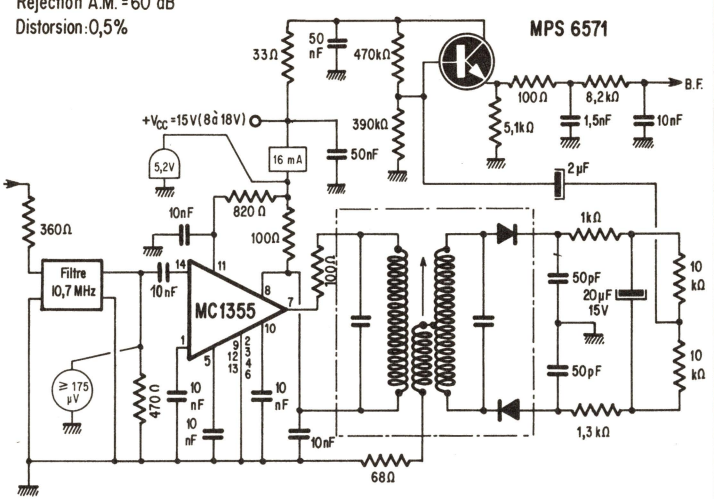


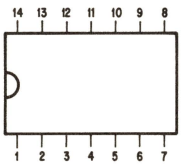
Amplif. Démodulateur

MC 1355

Motorola

F.I-F.M.
Réjection A.M. = 60 dB
Distorsion : 0,5%



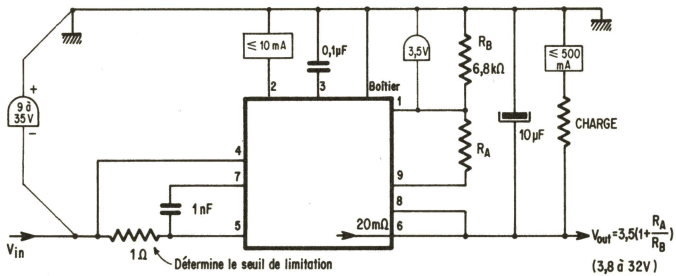


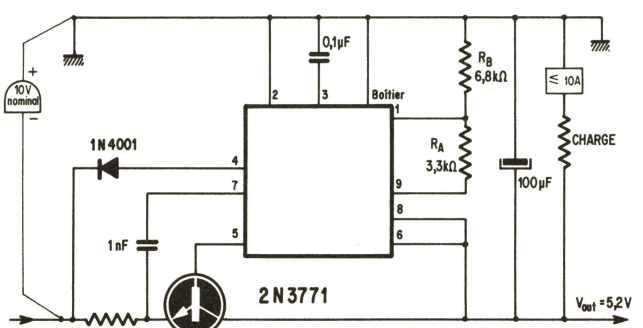
Régulateur_tensions négatives

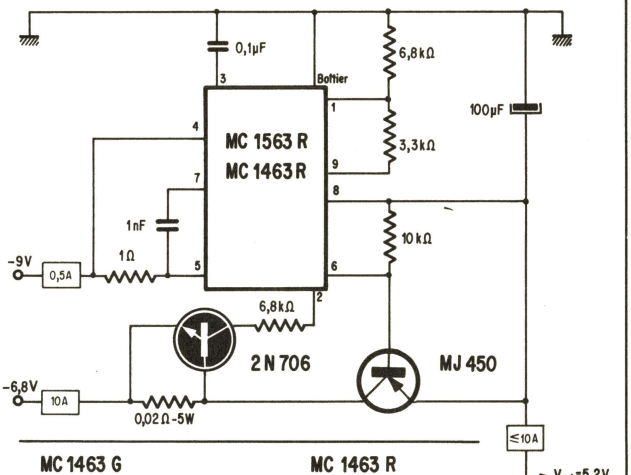
Dissipation 9W à 25°C au boîtier
$\Delta V_{out}/\Delta T = \pm 0{,}002\ \%/°C$

MC 1463

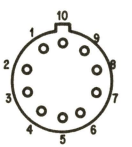
Motorola



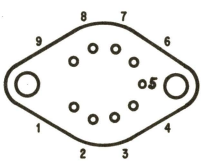




MC 1463 G



MC 1463 R

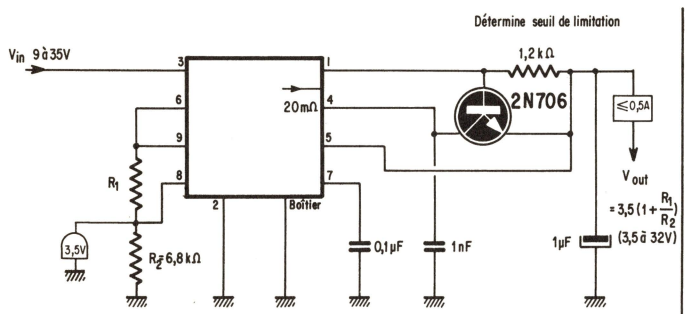


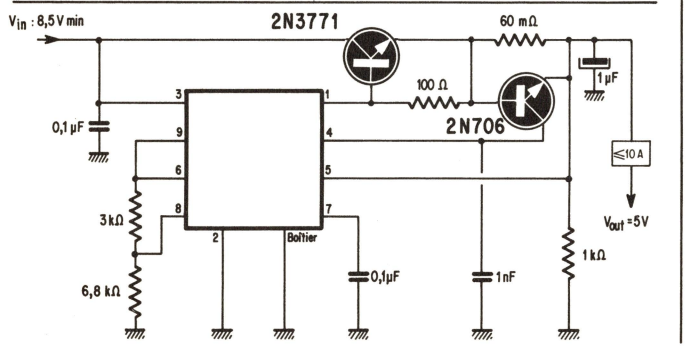
Régulateur_tensions positives

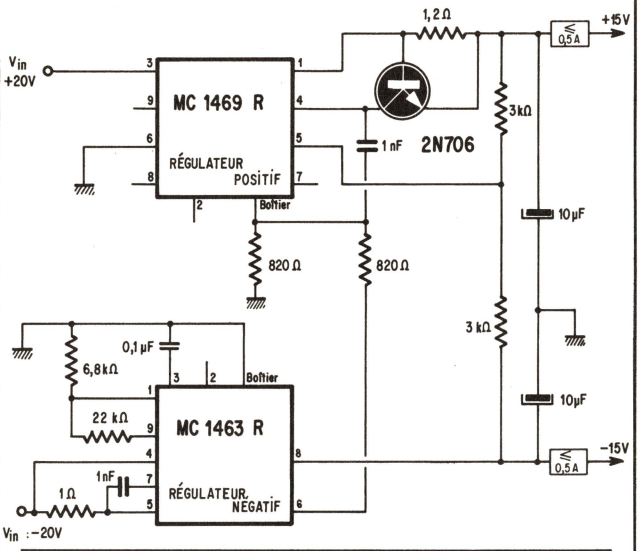
Dissipation 17,5 W à 25 °C au boîtier
$\Delta V_{out} / \Delta T = \pm 0{,}002\,\%/°C$

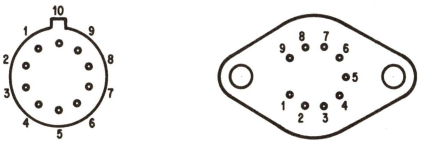
MC 1469

Motorola







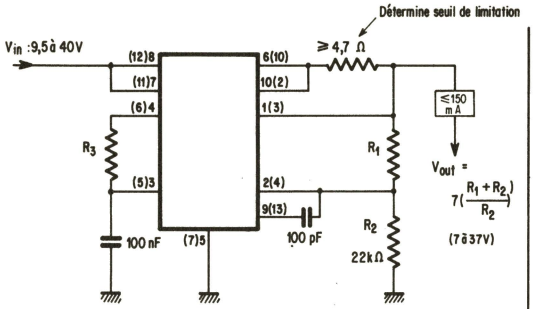


Régulateur tension

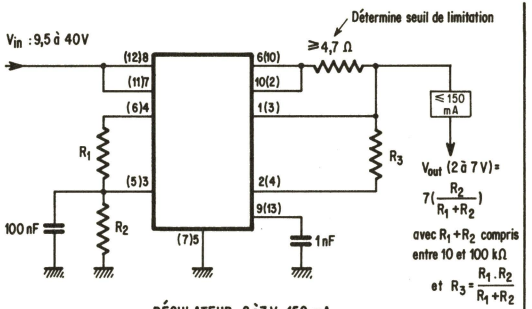
$\Delta V_{out} / \Delta T = \pm 0{,}003\,\%/°C$

MC 1723 C

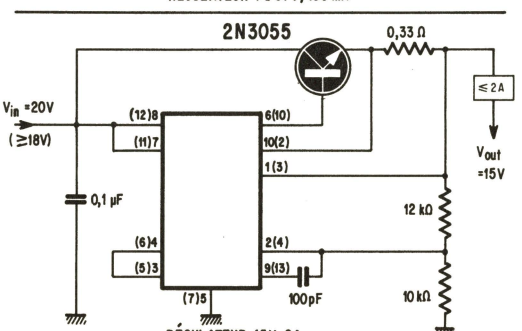
Motorola
=LM 723,µA723,CA723T



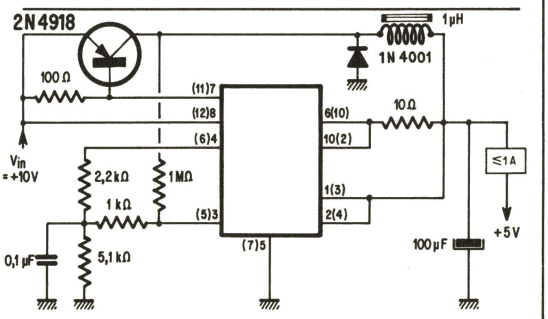
RÉGULATEUR 7 à 37V, 150 mA



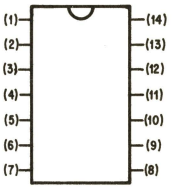
RÉGULATEUR 2 à 7V, 150 mA



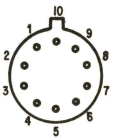
RÉGULATEUR 15V, 2A



RÉGULATEUR A DÉCOUPAGE, 5V, 1A



MC 1723 CP
(LM 723 CN)
(µA 723 PC)



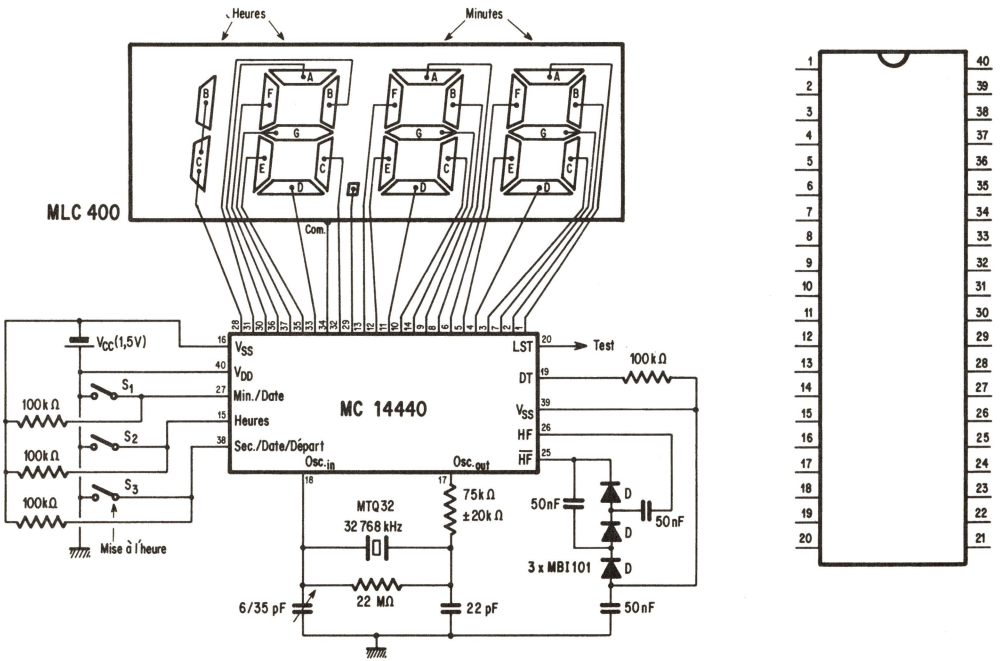
MC 1723 CG
(LM 723 CH)
(µA 723 HC)

Horloge digitale

0 à 12 heures_Affich. Cristaux liquides (MLC 400)

MC 14440

Motorola

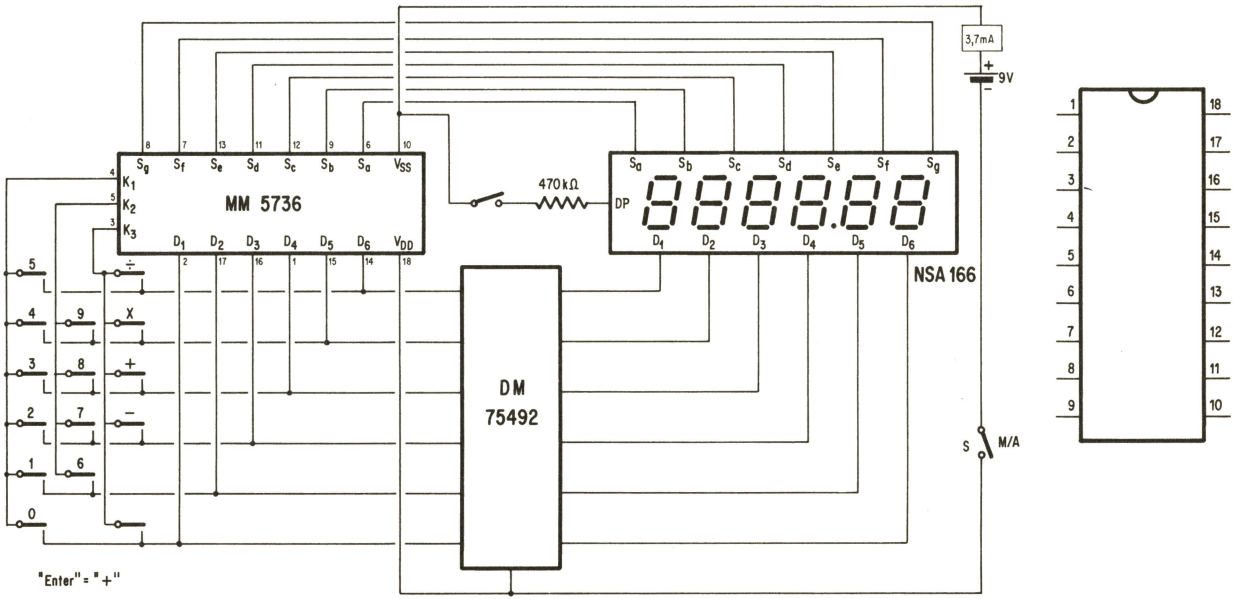


Calculateur électronique

Notation polonaise inversée
Virgule fixe

MM 5736

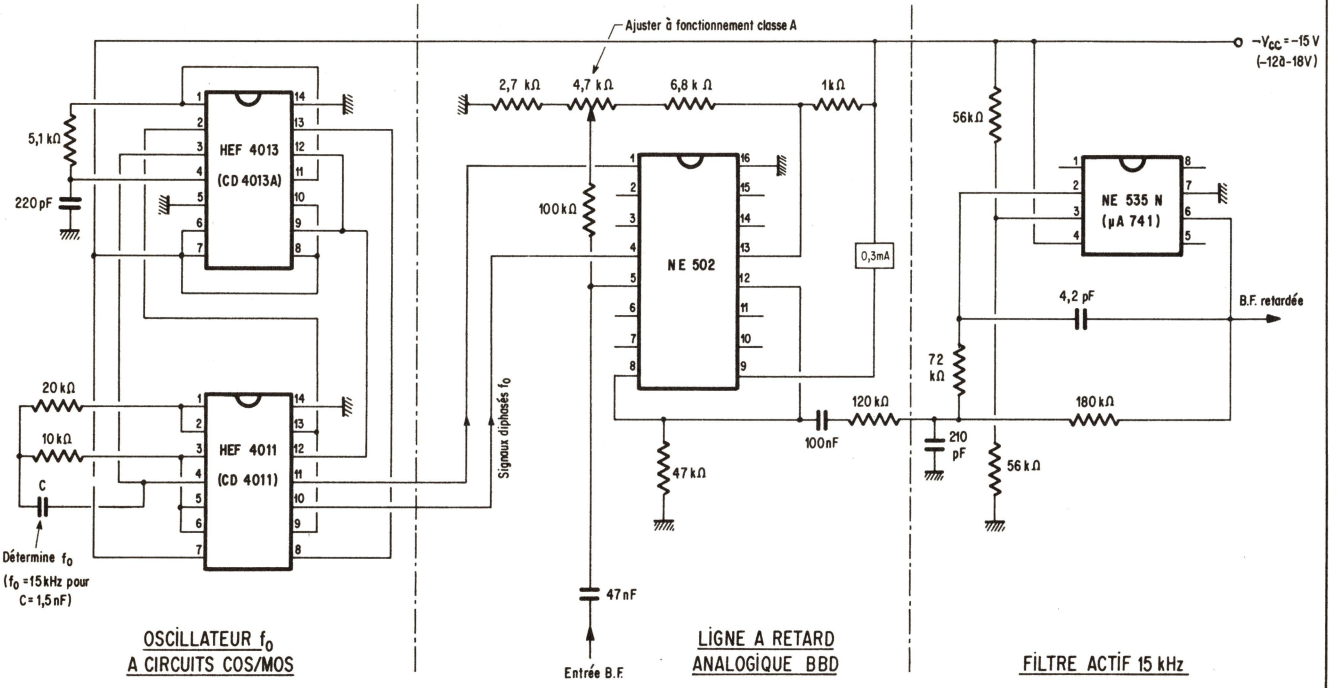
0 à 70°C
National Semiconductor



Ligne à retard analogique BBD

Retard : $512/2f_0$ (0,51 à 51 ms)
f_0 : 5 à 500 kHz)

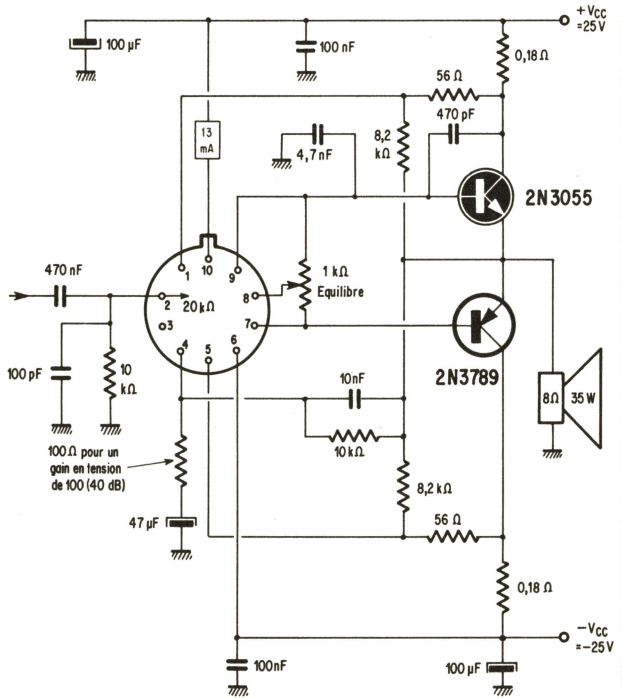
NE 502



Commande transistors puissance B.F. - 35W

NE 540

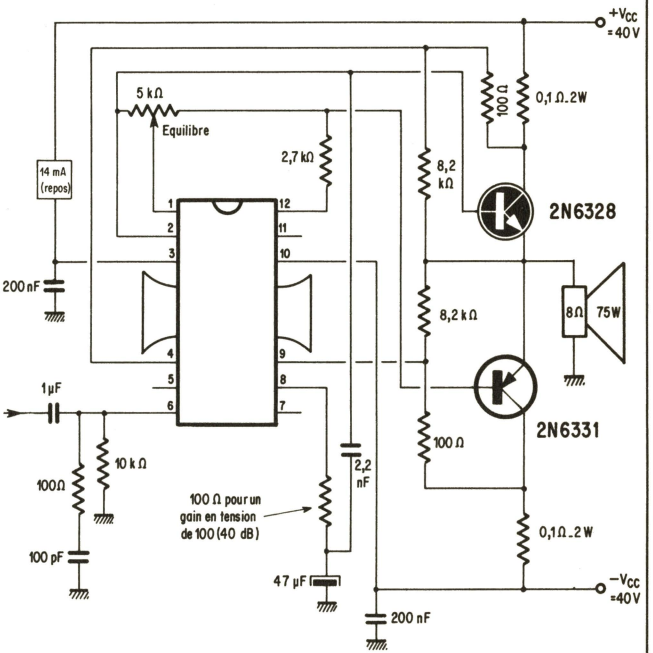
R.T.C. - Signetics



Commande transistors puissance B.F. - 75W

NE 541

R.T.C. - Signetics

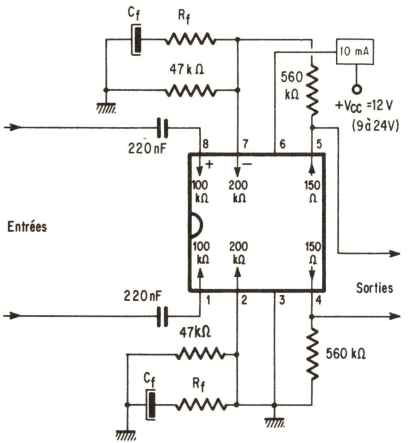


Double préamplificateur B.F.

Facteur de bruit : 1,6 dB

NE 542

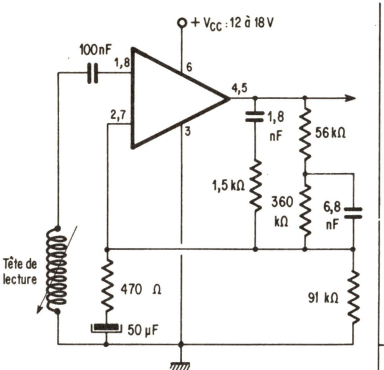
R.T.C. - Signetics



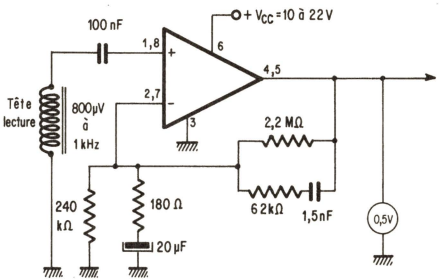
AMPLIF. LINÉAIRE

R_f détermine le gain en tension

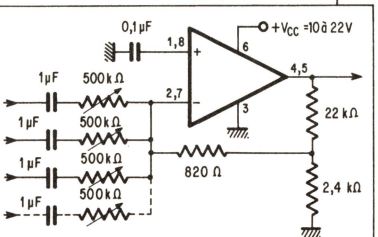
G_v	10	40	125	400	1200
R_f (kΩ)	∞	22	4,7	1,5	0,47
C_f (μF)	0	10	22	47	100



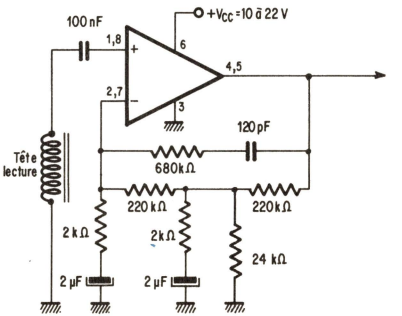
PRÉAMPLIF. PHONO RIAA



LECTURE BANDE MAGNÉTIQUE



PUPITRE MÉLANGE



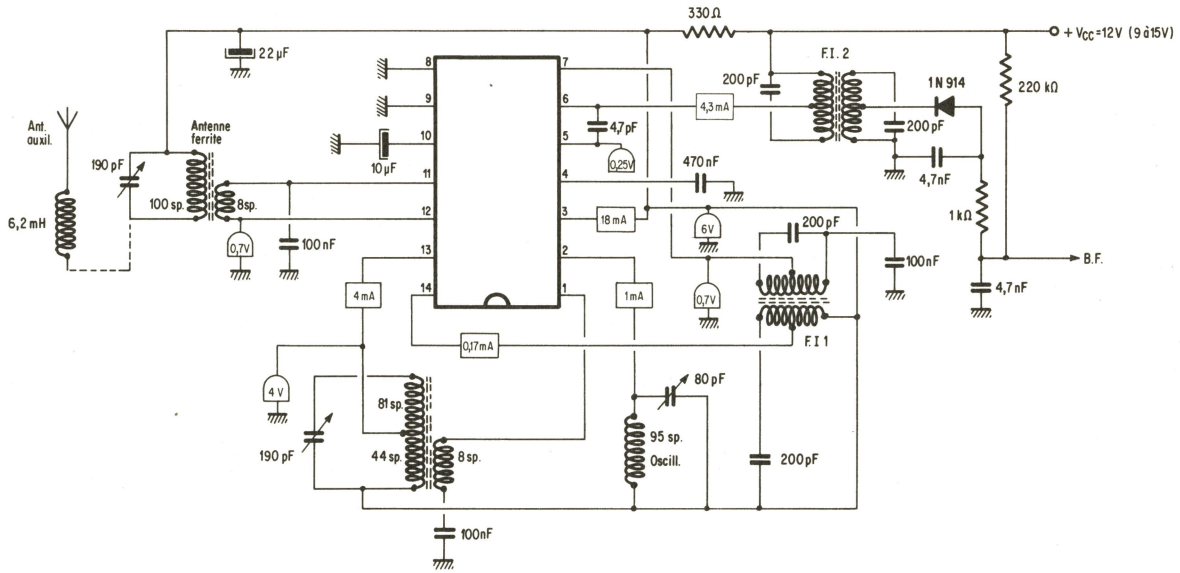
LECTURE BANDE MAGNÉTIQUE _NAB

Amplif. H.F. - Conversion - F.I. - Démodulation

Radioréception A.M. - C.A.G. (10 µV à 10 mV entrée)

NE 546

R.T.C. - Signetics



Amplif.-démodulateur F.M.

< 35 MHz - Gain 68 dB
Distorsion : 0,55 %
Réjection A.M. : 60 dB

S 041 P
(S 041 E)

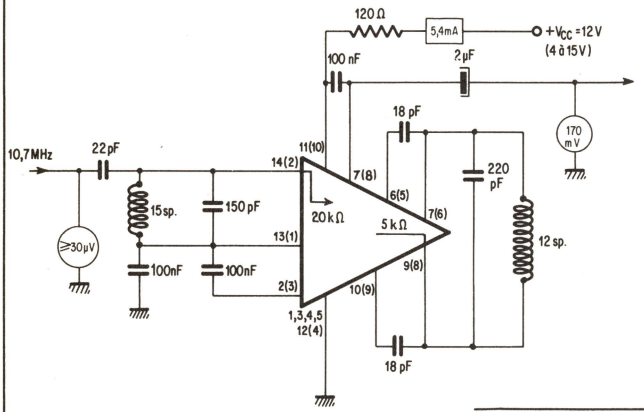
Siemens

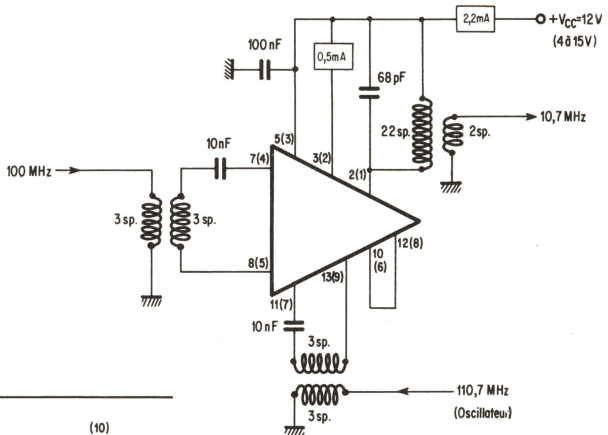
Convertisseur ≤ 200 MHz

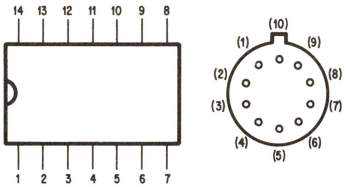
Gain : 16,5 dB à 100 MHz
Facteur de bruit : 7 dB

S 042 P
(S 042 E)

Siemens





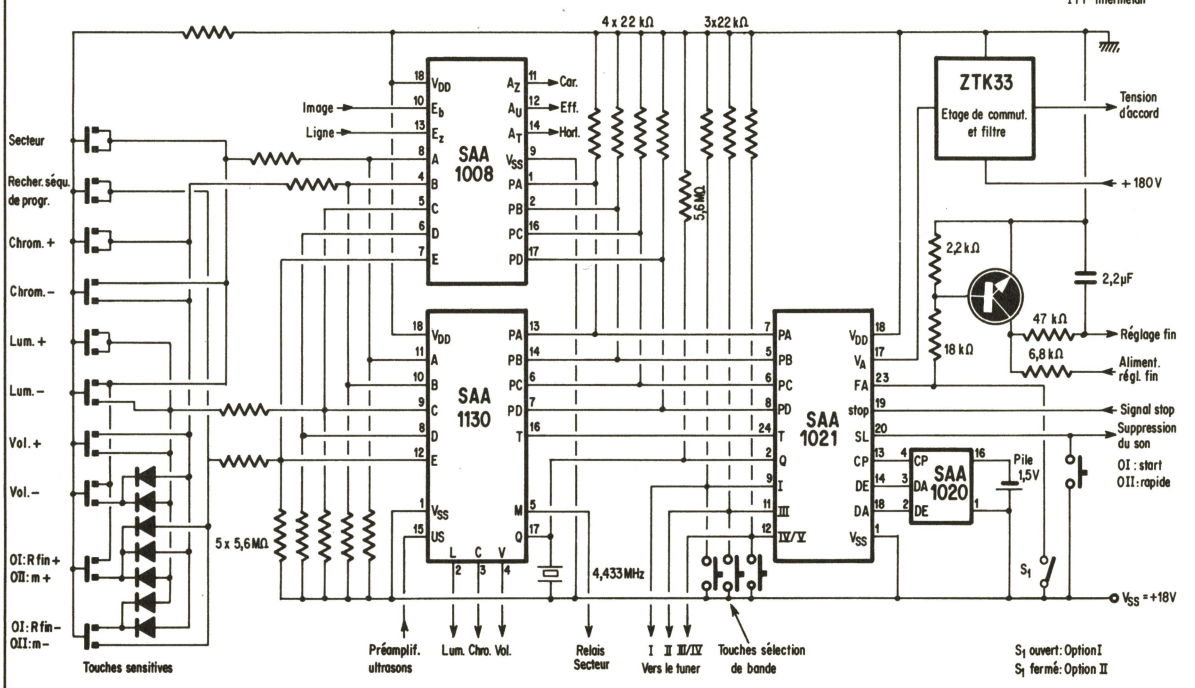


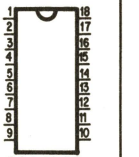
Commande digitale Tuner T.V.

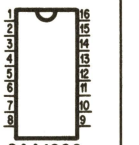
Récepteur commandes ultrasons SAA1130
Affichage numérique par SAA 1008

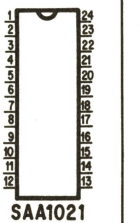
SAA 1008, SAA 1020, SAA 1021, SAA 1130

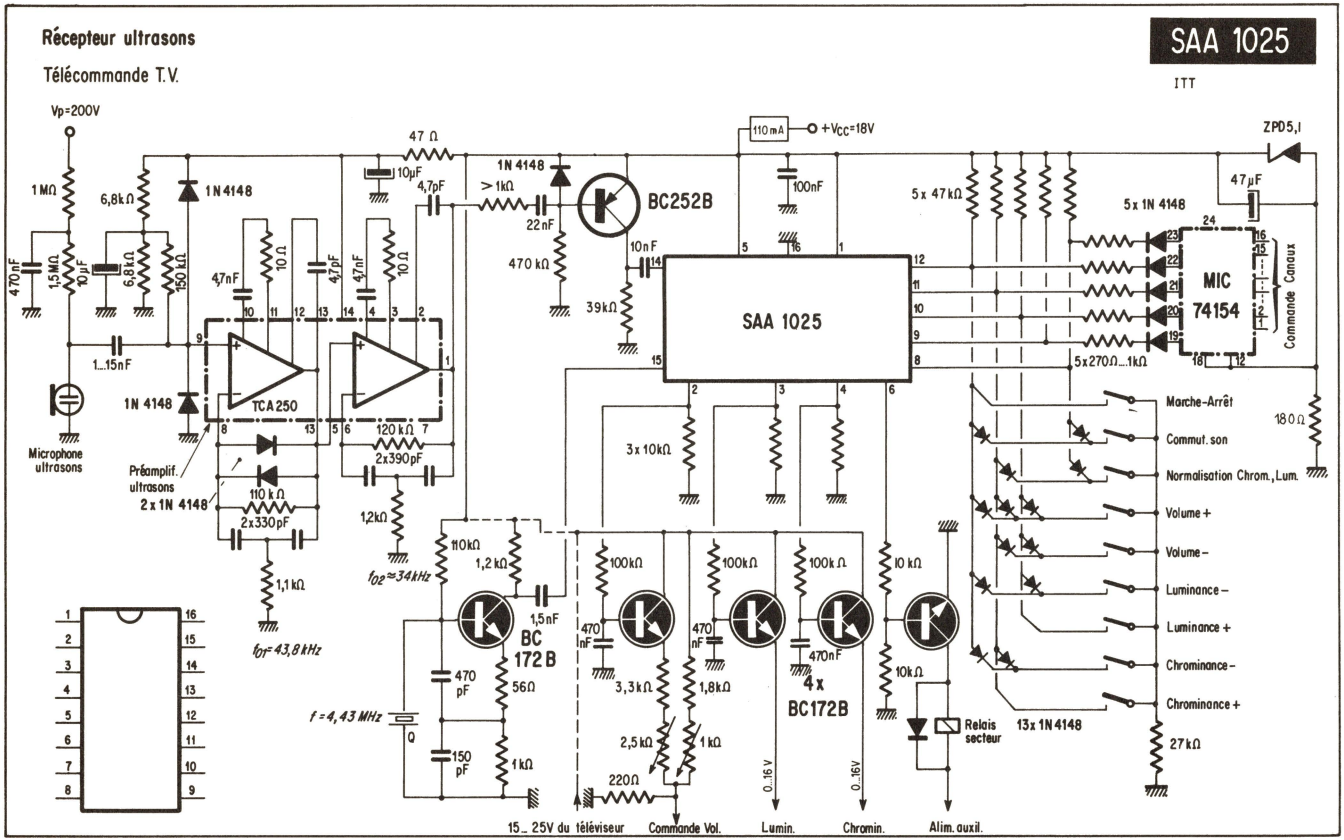
ITT-Intermetall









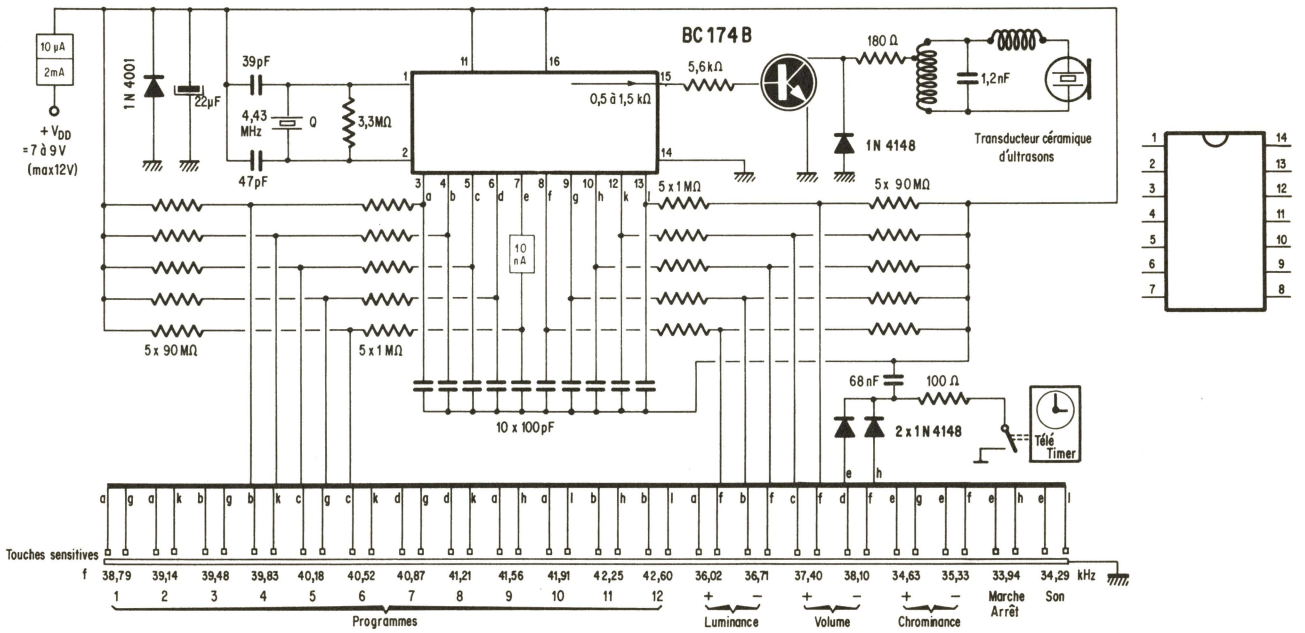

Récepteur ultrasons
Télécommande T.V.
SAA 1025
ITT
Vp=200V
1 MΩ
6,8kΩ
1N 4148
47 Ω
10µF
4,7pF
1N 4148
>1kΩ
22nF
BC252B
110 mA
+Vcc=18V
100nF
ZPD5,1
47µF
5 x 47kΩ
5 x 1N 4148
MIC 74154
Commande Canaux
470nF
1,5MΩ
10µF
6,8kΩ
150 kΩ
4,7nF
10 Ω
47pF
4,7nF
10 Ω
470 kΩ
10nF
39kΩ
SAA 1025
1...15nF
1N 4148
TCA 250
120 kΩ
2x390pF
5x270Ω...1kΩ
180Ω
Microphone ultrasons
Préamplif. ultrasons
2 x 1N 4148
110 kΩ
2x330pF
1,2kΩ
1,1kΩ
3x 10kΩ
Marche-Arrêt
Commut. son
Normalisation Chrom., Lum.
Volume +
Volume –
Luminance –
Luminance +
Chrominance –
Chrominance +
27kΩ
f_{02}≈34kHz
f_{01}=43,8kHz
110kΩ
1,2kΩ
1,5nF
BC 172 B
100kΩ
100kΩ
100kΩ
10 kΩ
470 nF
470 nF
470nF
4x BC172B
10kΩ
470 pF
56Ω
3,3kΩ
1,8kΩ
f=4,43 MHz
Q
150 pF
2,5kΩ
1 kΩ
1 kΩ
220Ω
Relais secteur
13x 1N 4148
0..16 V
0..16V
15 .. 25V du téléviseur
Commande Vol.
Lumin.
Chromin.
Alim. auxil.

Emetteur ultrasons

pour télécommande T.V.
30 canaux max.

SAA 1124

ITT-Intermetall

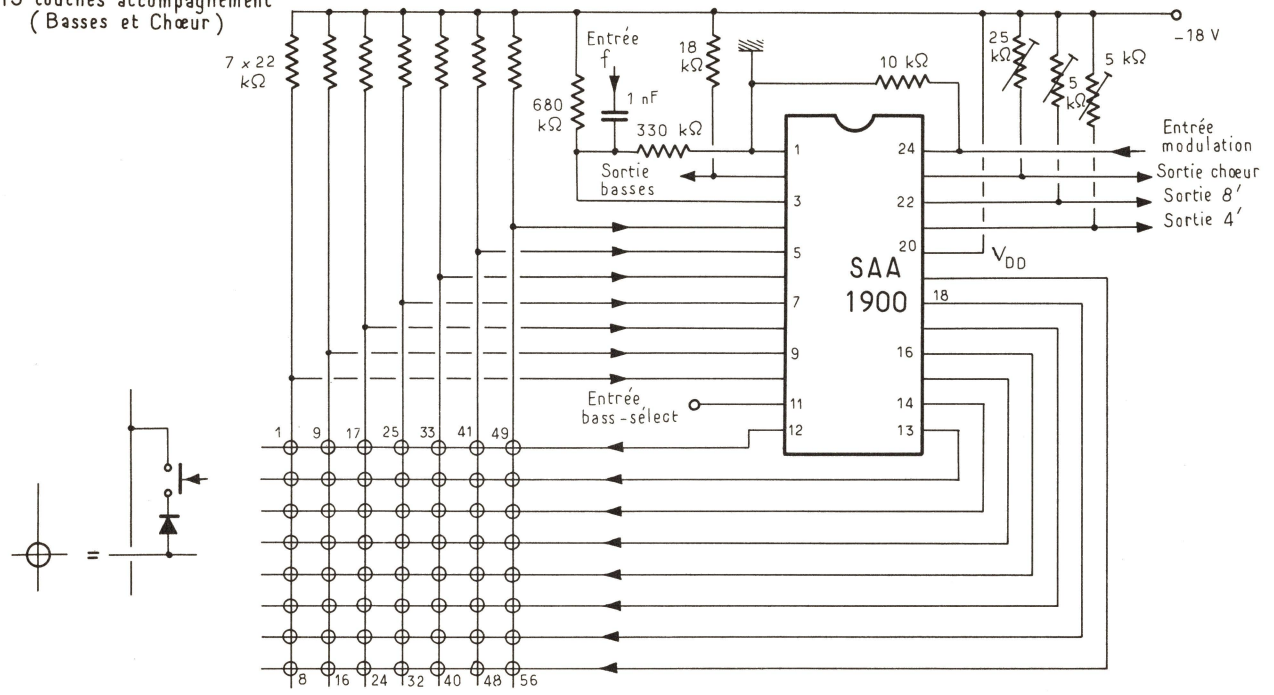


Orgue électronique jouet

37 touches solo (8′ et 4′)

19 touches accompagnement
(Basses et Chœur)

SAA 1900

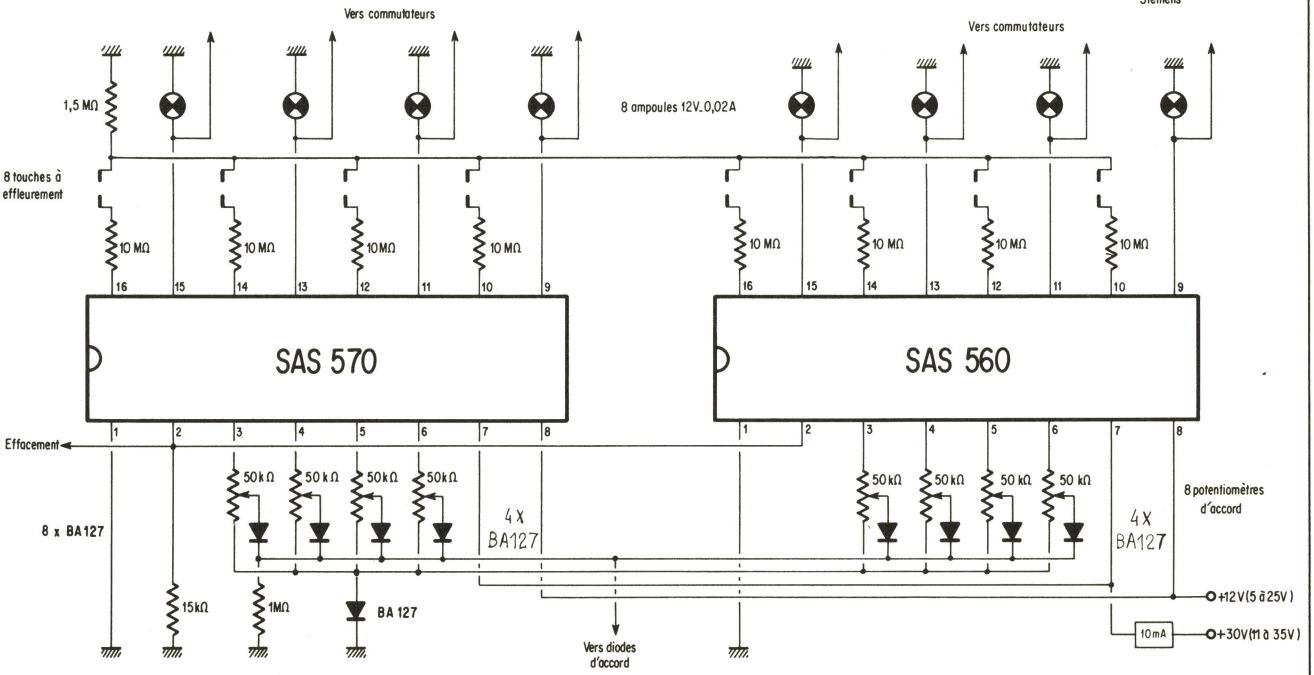


Commande touches effleurement

SAS 560 : Unité de base
SAS 570 : Elargissement

SAS 560
SAS 570

Siemens



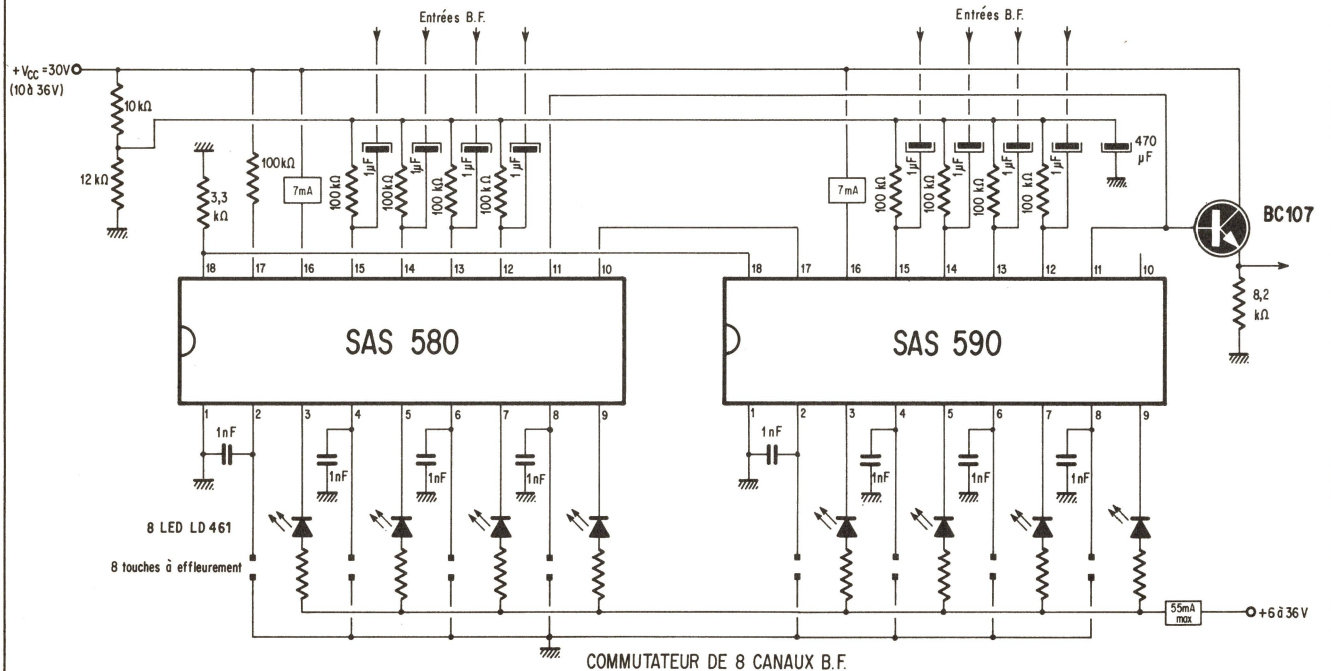
COMMANDE CANAUX TÉLÉVISION

Commande touches effleurement

SAS 580 : Unité de base
SAS 590 : Elargissement

SAS 580
SAS 590

Siemens

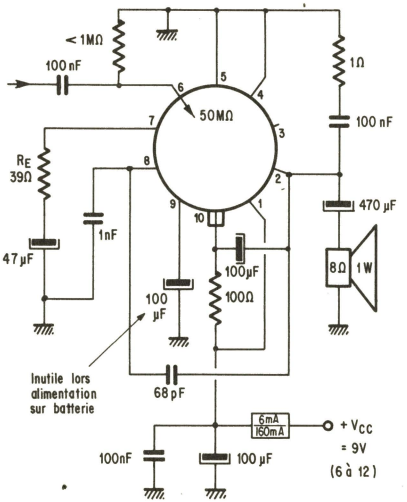


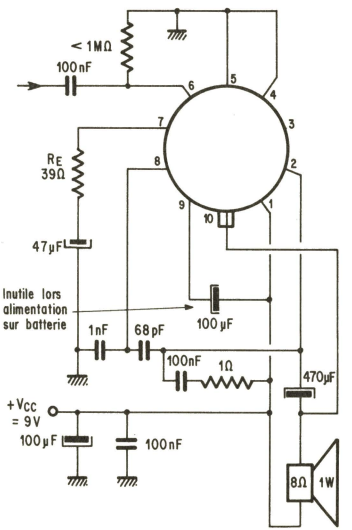
B.F. puissance 1W

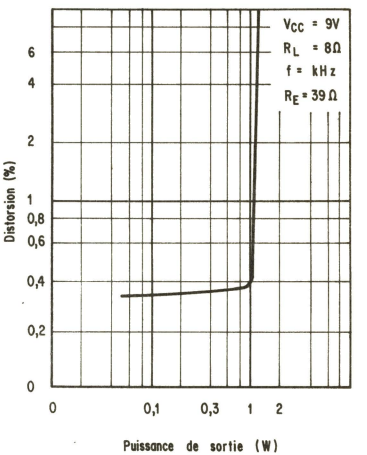
Gain en tension: 46 dB

SFC 2790 C

Sescosem





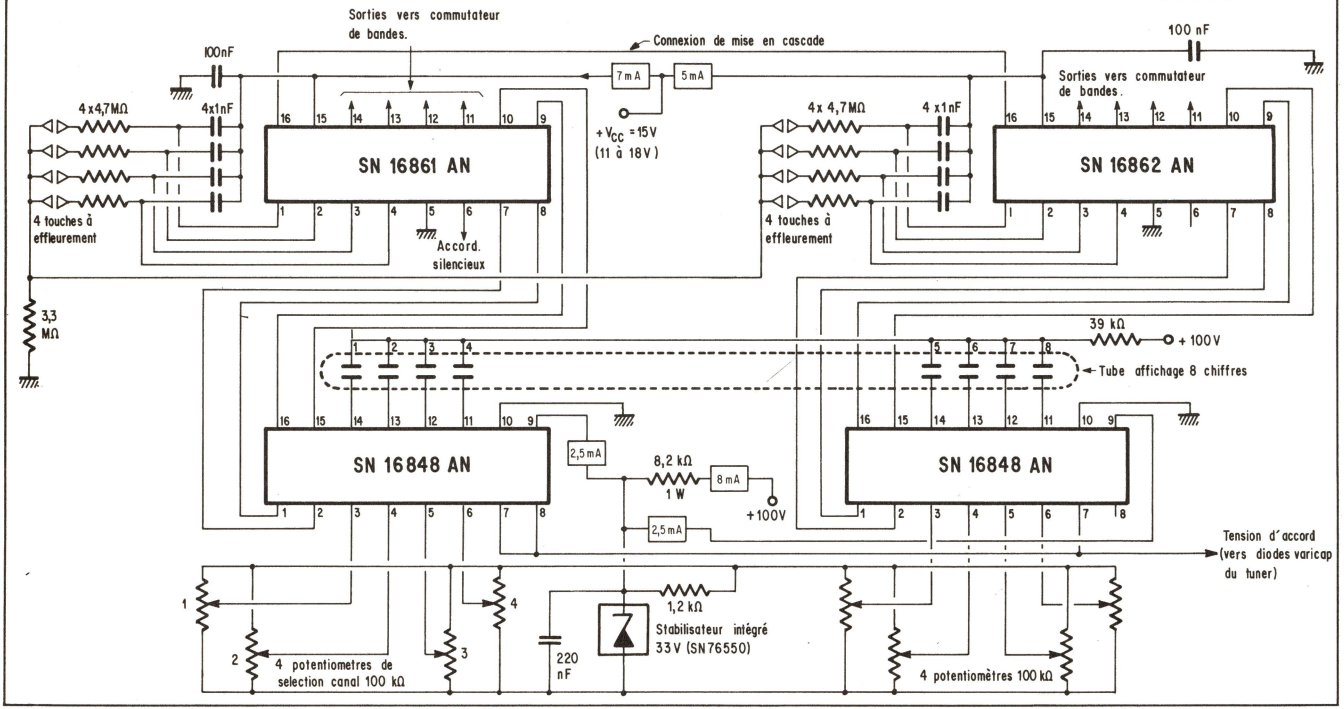


Commande touches à effleurement

Unité de base SN 16861 AN _ Elargissement SN 16862
Commutateur analogique SN 16848 AN

SN 16848 AN
SN 16861/2 AN

Texas Instruments

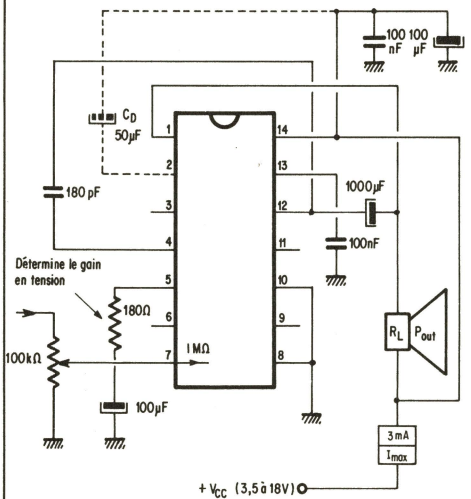


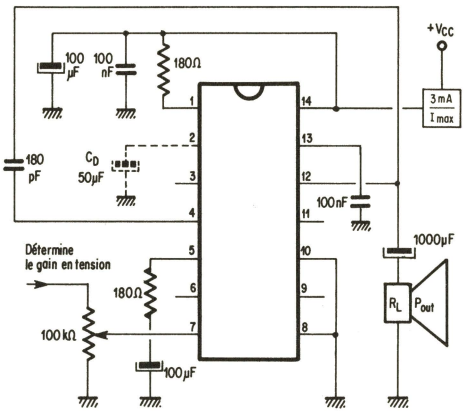
B.F. puissance 0,14 à 2 W

Gain en tension : 33 dB
Rapport signal / bruit : 70 dB

SN 16975

Texas Instruments





C_D est inutile lors alimentation sur batterie

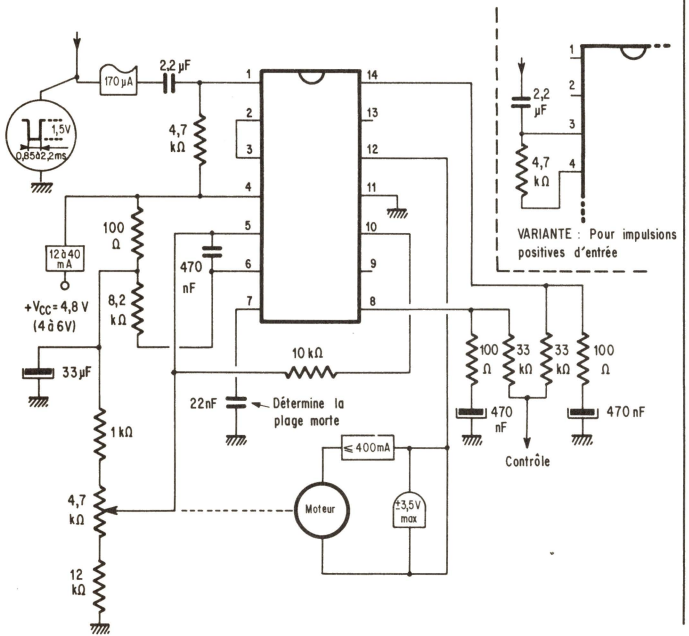
V_{CC} (V)	R_L (Ω)	P_{out} (W)	I_{max} (mA)
3,5	8	0,14	60
3,5	4	0,2	100
9	8	1,2	200
9	4	1,7	300
12	8	2	250

Commande proportionnelle

Télécommande modèles réduits

SN 28654 N

Texas Instruments

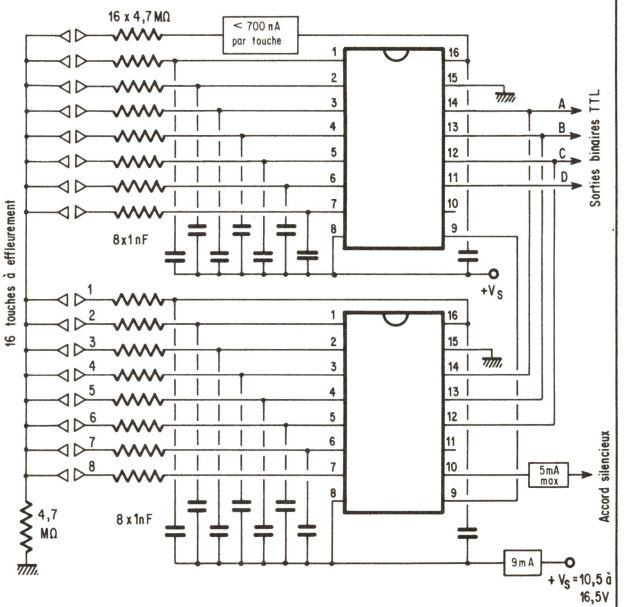


Commande touches à effleurement

Commutation et mémoire pour 16 canaux

SN 29791 N

Texas Instruments

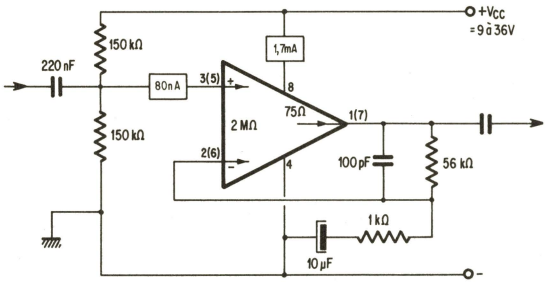


Amplif. opérationnel double

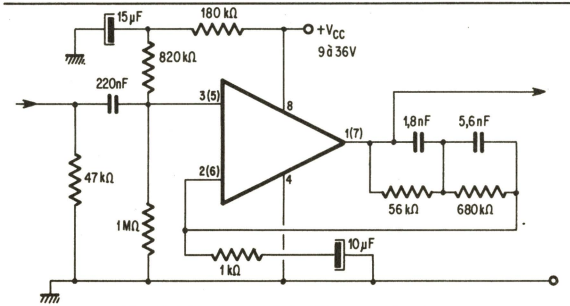
(= 2 x µA 741)

SN 72558

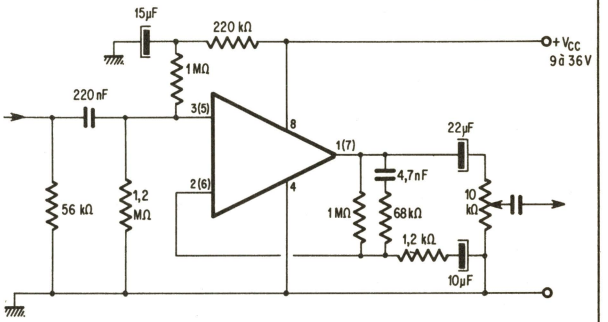
Texas Instruments
= MC1458 Motorola
= CA1458 R.C.A.
= µA1558 Fairchild
= SFC 2458 Sescosem
= N5558 RTC



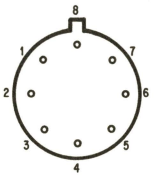
AMPLIF. CORRECTEUR MICROPHONE DYNAMIQUE

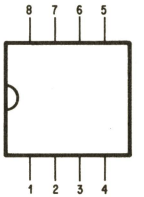


AMPLIF. LECTURE PHONO (Tête magnétique)



AMPLIF. LECTURE ENREG. MAGNÉTIQUE



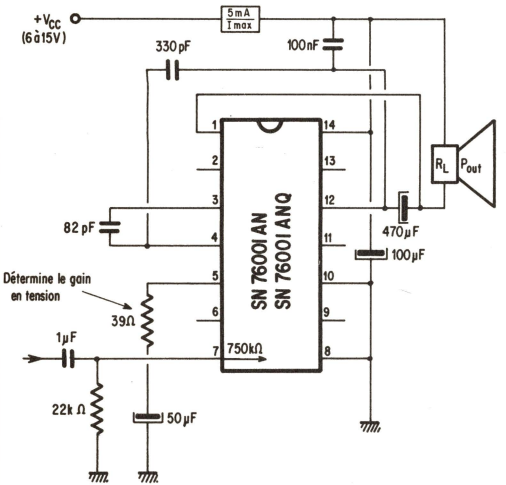


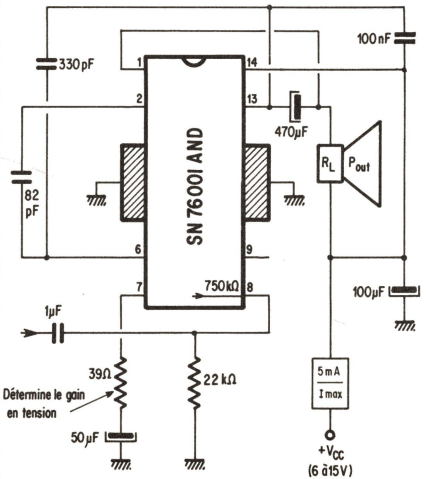
B.F. puissance 0,6 à 3,2 W

Gain en tension : 46 dB

SN 76001 AN/NQ
SN 76001 AND

Texas Instruments





Types		V_{CC} (V)	R_L (Ω)	P_{out} (W)	I_{max} (mA)
SN 76001 AND	SN 76001 AN/NQ	6	4	0,65	160
		9	4	2	300
		9	8	1,1	160
		9	16	0,6	100
		12	4	2,7	300
		12	8	2	240
		12	16	1,2	150
		15	8	3,2	350
		15	16	1,8	160

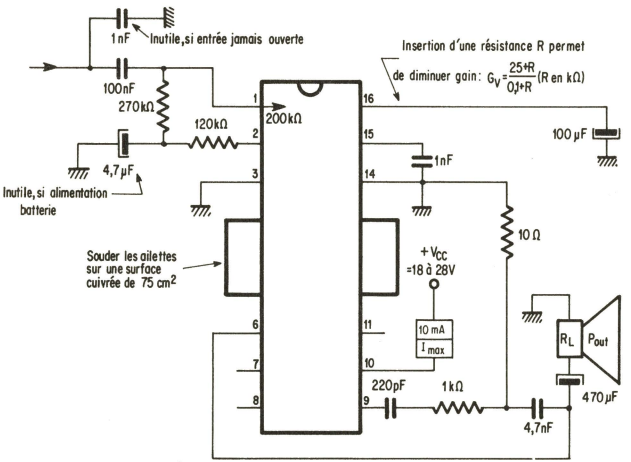
B.F. Puissance ≤ 8 W

Gain en tension : 46 dB
Bruit en sortie : 1,5 mV
V_{CC} = 35 V max. pour SN 76003
28 V max. pour SN 76013

SN 76003 N
SN 76013 N

Texas Instruments

SN 76003 N = SN 76033
SN 76013 N = SN 76023



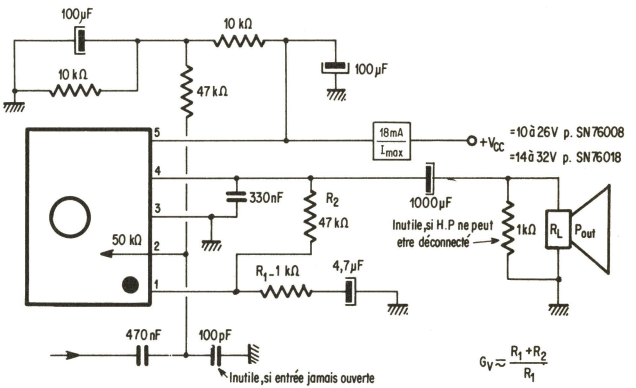
V_{CC} (V)	20	20	24	24	24	28	28	28
R_L (Ω)	15	8	20	15	8	20	15	8
P_{out} à 10% dist. (W)	2,8	4,6	3,2	4,2	6,3	4,8	5,8	8,5
P_{out} à 1% dist. (W)	2	3,5	2,7	3,3	4,8	4	4,7	6,5
I_{max} (mA)	100	150	250	260	420	220	300	500

B.F. Puissance ≤ 12 W

Gain en tension : 34 dB
Bruit en sortie < 2 mV
Gain en boucle ouverte : 60 dB

SN 76008
SN 76018

Texas Instruments



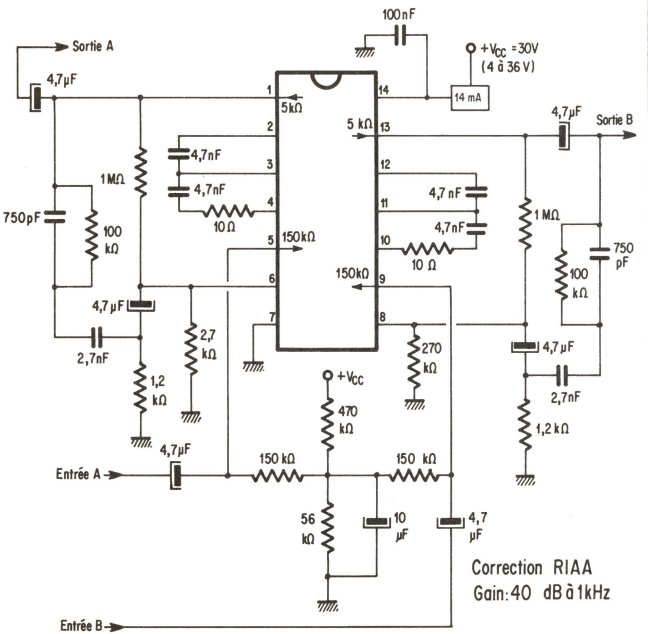
	SN 76008		SN 76018				
V_{CC} (V)	12	12	18	18	24	24	28
R_L (Ω)	8	4	8	4	8	4	8
P_{out} à 10% dist. (W)	1,5	2,5	3,5	7	7,5	12	11
P_{out} à 1% dist. (W)	0,9	2	3	5,5	6	10	8,5
I_{max} (mA)	150	250	120	600	420	750	500

Préamplif. stéréo

SN 76131 N

Texas Instruments

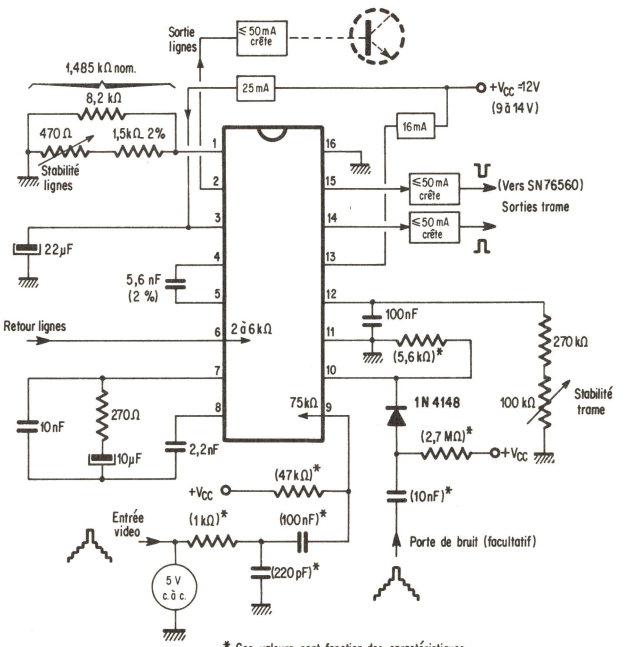
Facteur de bruit : 2 dB
Séparation canaux : 80 dB à 1 kHz



Commande lignes et trames TV

SN 76544

Texas Instruments

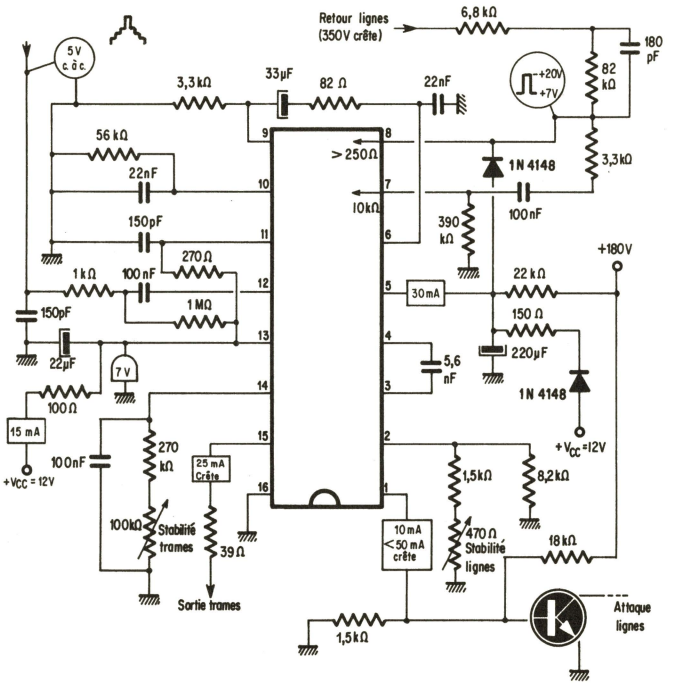


* Ces valeurs sont fonction des caractéristiques des sources de commande

Commande lignes et trames TV

SN 76545 N

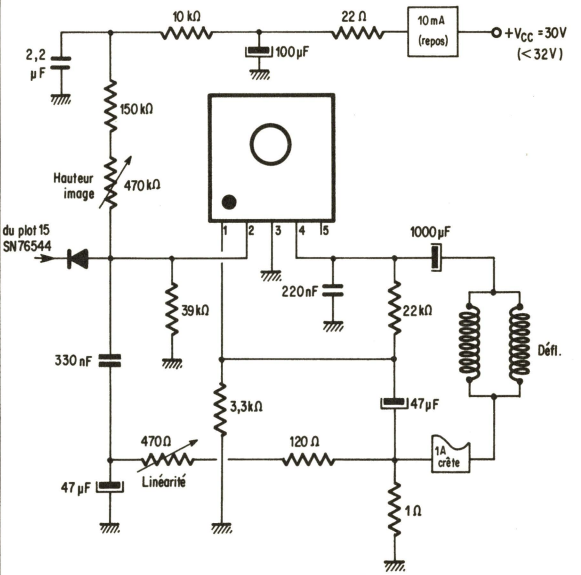
Texas Instruments



Amplif. sortie trames TV

SN 76560 KE

Texas Instruments

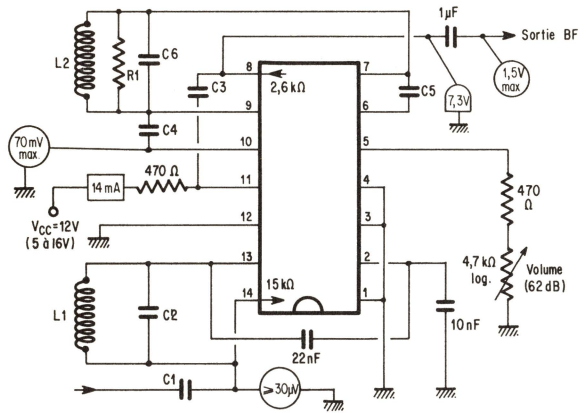


Amplif.-démodulateur F. I. - F. M.

SN 76660

Texas Instruments

Gain à 5,5 MHz : 65 dB
Suppression A.M. : 55 dB

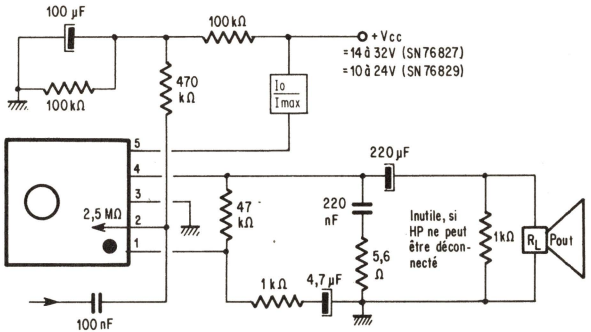


APPLICATION		C1 (pF)	C2 (pF)	C3 (nF)	C4 (pF)	C5 (pF)	C6 (pF)	L1 spires	L2 spires	R1 (kΩ)
Son TV - 5,5 MHz		47	220	22	56	56	1500	20	8	∞
Radio 10,7 MHz	Mono	27	120	22	27	27	470	20	8	∞
	Stéréo	47	150	0,47	30	30	330	15	12	1

B.F. Puissance 2,5 à 12 W

SN 76827
SN 76829

Texas Instruments

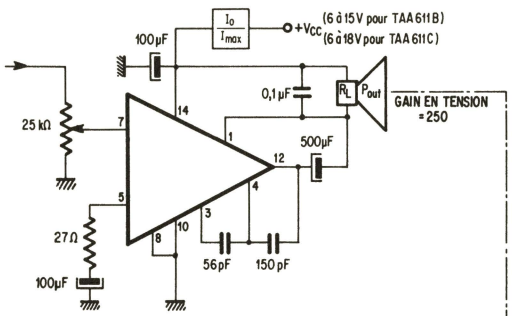


TYPES	SN 76829					SN 76827			
V_{CC} (V)	12	12	14,4	14,4	16	24	26	26	28
R_L (Ω)	4	2	4	2	4	4	8	4	8
P_{out}, dist. 10 % (W)	2,5	4,5	4,5	7,7	5,6	12,5	11	14	11
P_{out}, dist. 2 % (W)	–	–	3,6	6	–	10	8	10	10
Io (mA)	10	10	12	12	14	25	25	25	25
Imax (mA)	300	600	450	750	500	750	600	800	550

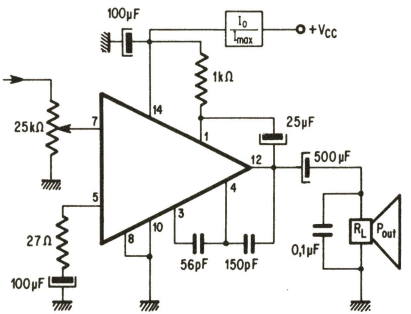
B.F. Puissance 1 à 3,3 W

TAA 611 B
TAA 611 C

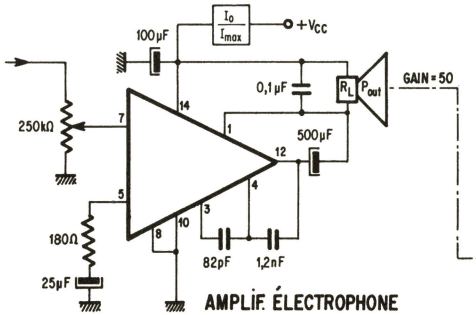
S.G.S - Ates



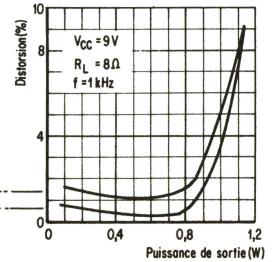
AMPLIF. RADIO

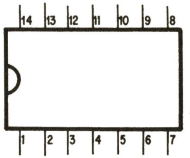


AMPLIF. RADIO (H.P. A LA MASSE, GAIN=250)



AMPLIF. ÉLECTROPHONE





TAA 611B, R_L = 8 Ω		
V_{CC} (V)	9	12
P_{out} (W)	1,15	2,1
I_o (mA)	3	3,5
I_{max} (mA)	170	235

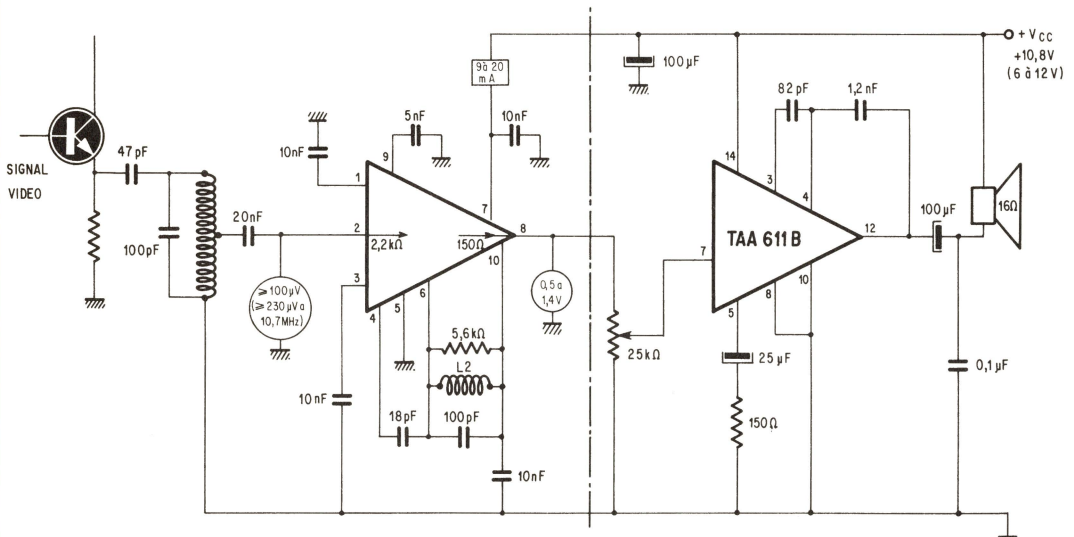
TAA 611C					
V_{CC} (V)	9	9	12	15	15
R_L (Ω)	4	8	8	8	16
P_{out} (W)	1,8	1,2	2,1	3,3	1,9
I_o (mA)	3	3	3,5	4	4
I_{max} (mA)	250	170	235	300	170

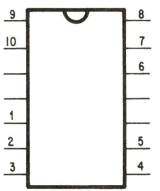
Amplif._démodulateur F.M.

Distorsion 1% _Réjection A.M. 45 dB

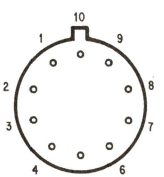
TAA 661

Sescosem_S.G.S._Ates





TAA 661 BX2



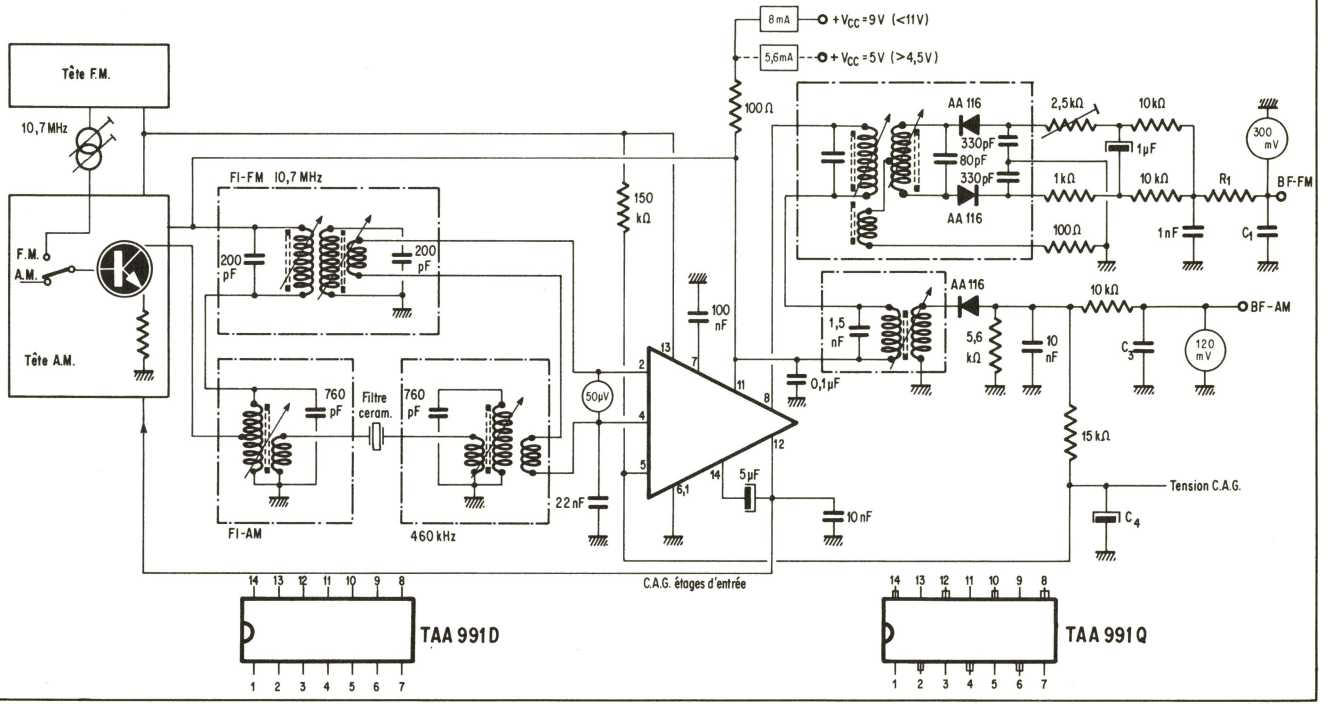
TAA 661 A55

Amplif. F.I A.M.-F.M.

Gain > 80 dB - C.A.G. > 50 dB

TAA 991 D

Siemens

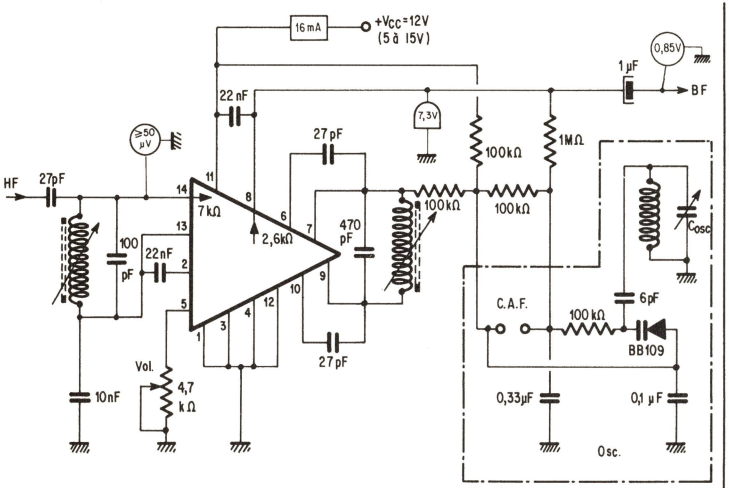


Amplif.-démodulateur F.M.

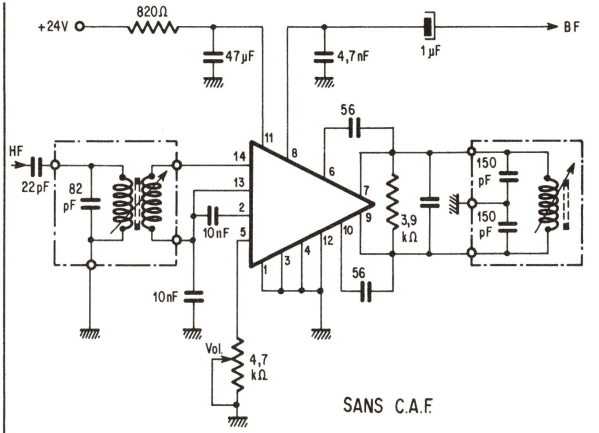
≤ 35 MHz _ Gain: 60 dB _ Distorsion: 1,8 %
Commande volume: 60 dB

TBA 120/A

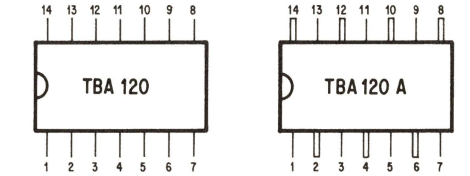
RTC _ Siemens



AVEC C.A.F.



SANS C.A.F.

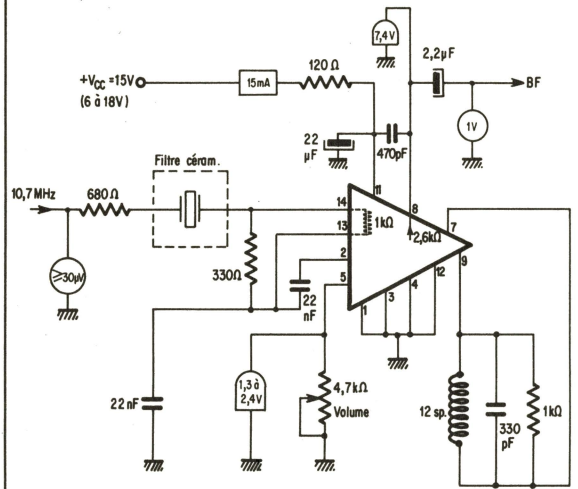


Amplif. démodulateur F.M.

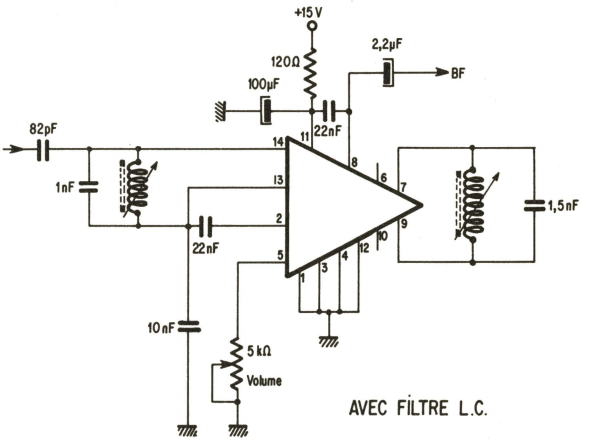
≤12 MHz - Gain: 68 dB - Distorsion: 1,3 %
Commande volume: 75 dB

TBA 120 S/AS

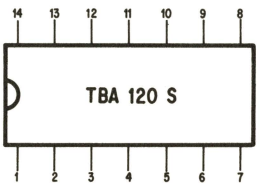
RTC - Siemens - Telefunken
= SN 76620AN Texas Instruments

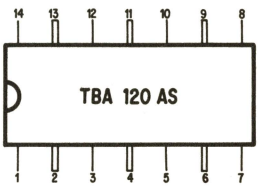


AVEC FILTRE CÉRAMIQUE



AVEC FILTRE L.C.



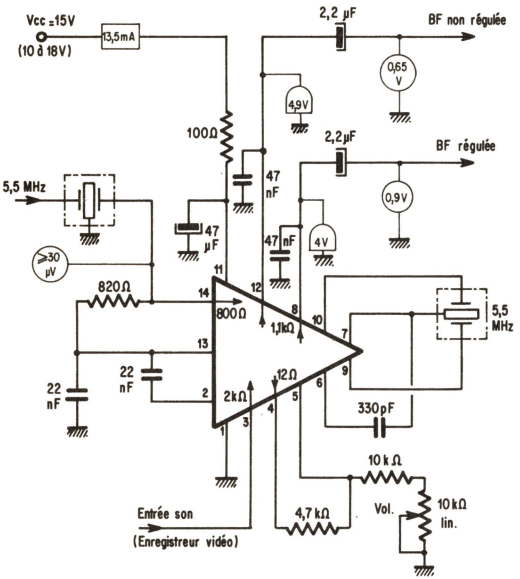


Amplif-démodulateur F.M.

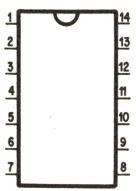
Gain 68 dB - Distorsion 1 % - Gain B.F. : 30 dB max
Commande volume : 85 dB - Réjection A.M. : 60 dB

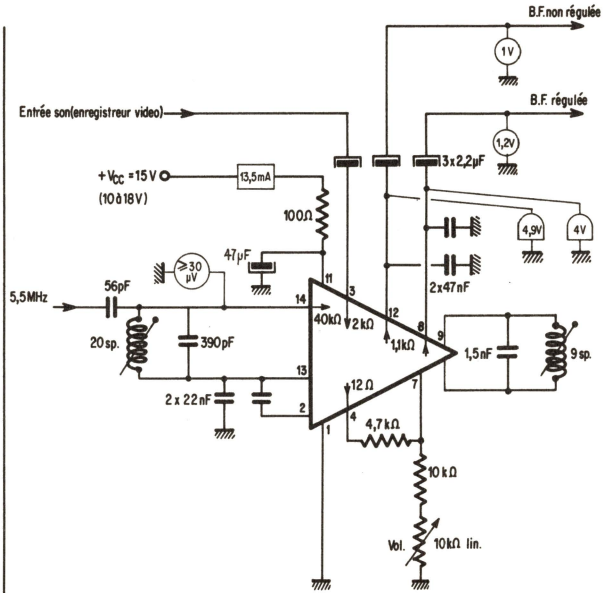
TBA 120 T
TBA 120 U

RTC - Siemens - Telefunken
Motorola - Sescosem



TBA 120T - FILTRES CÉRAMIQUES





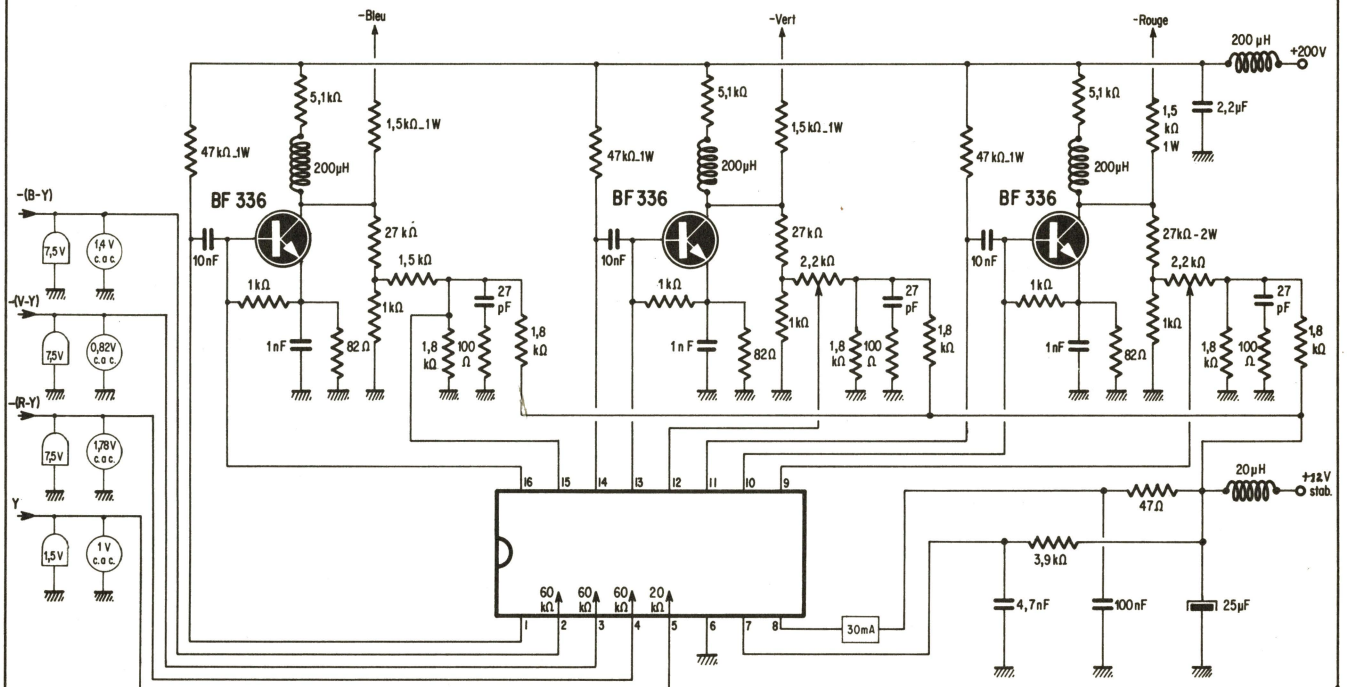
TBA 120U - FILTRES LC

Préamplif. et matrice TV couleurs

Gain 100 _ Bande 6 MHz

TBA 530

RTC _ Telefunken
Fairchild

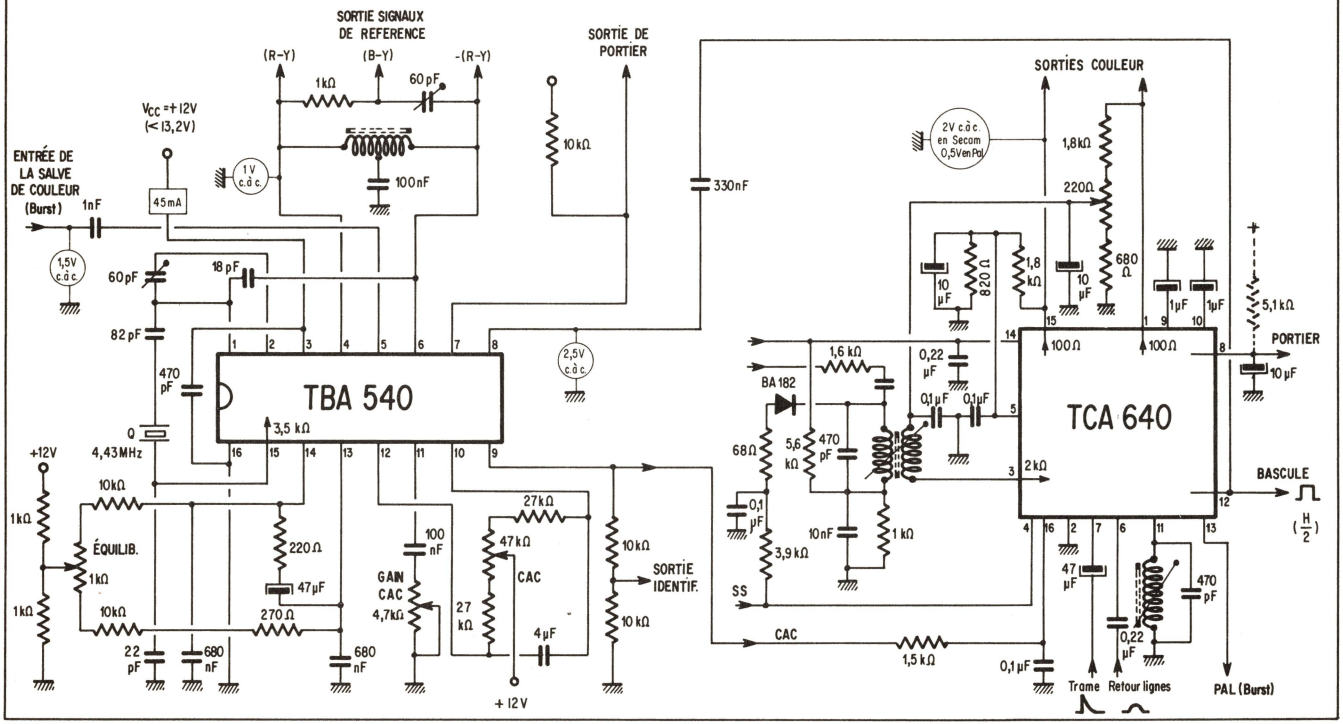


Régénérateur sous-porteuse PAL (TBA 540)

Amplif. chrominance Secam-PAL (TCA 640)

TBA 540-TCA 640

RTC_Telefunken_Fairchild

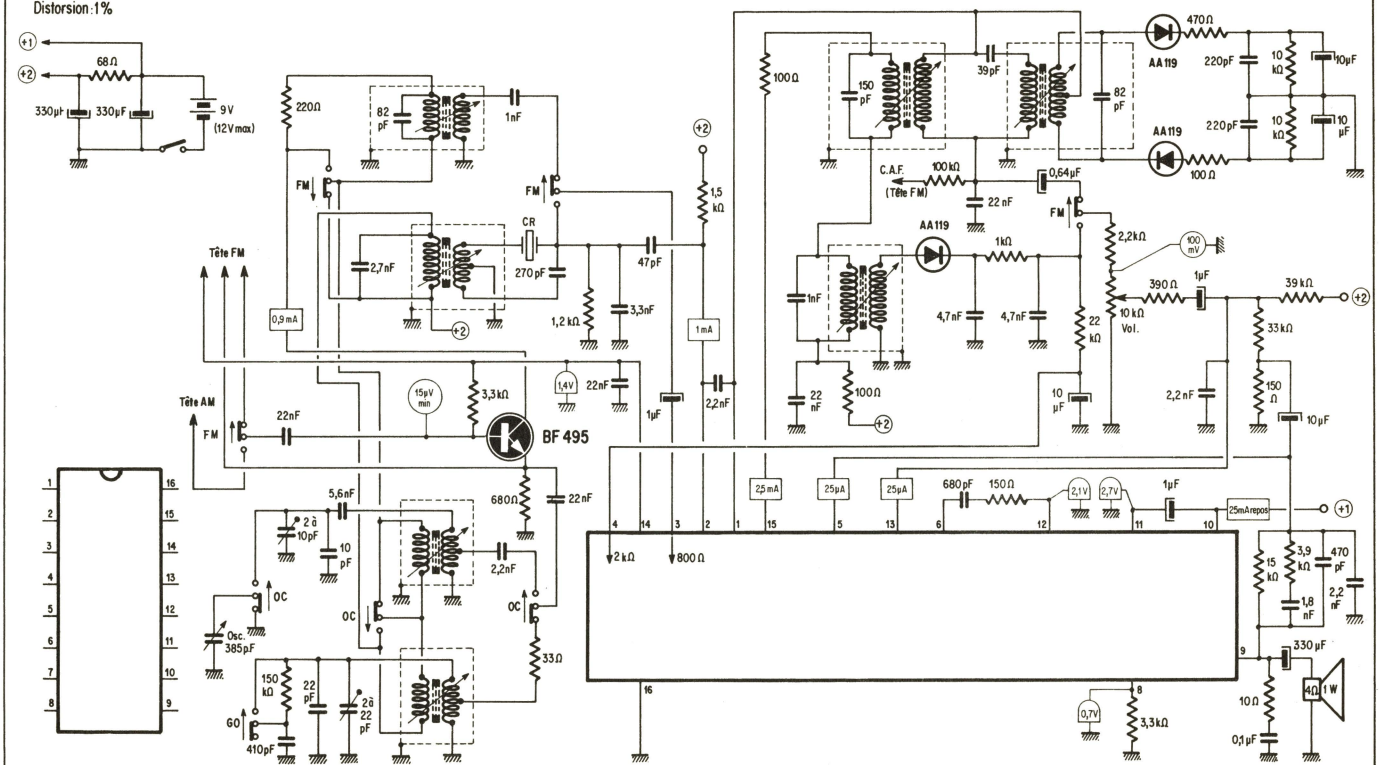


Récepteur A.M.-F.M.

C.A.G. = 42 dB
Distorsion : 1%

TBA 700

RTC



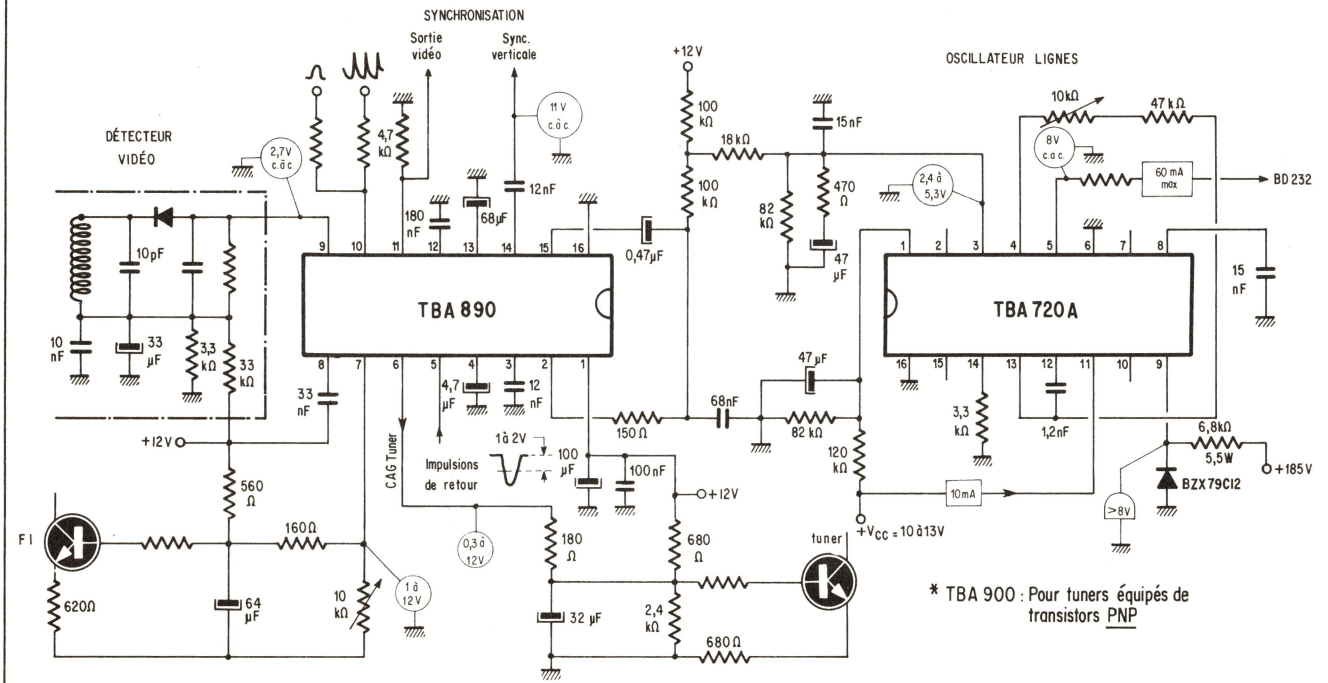
TBA 720 A : Rapport cyclique 20 à 60 %
Montée: 200 ns

TBA 890 : Gain video = 7 dB
Modulation négative

TBA 720 A - TBA 890 TBA 900 *

Oscillateur lignes

Traitement video
RTC



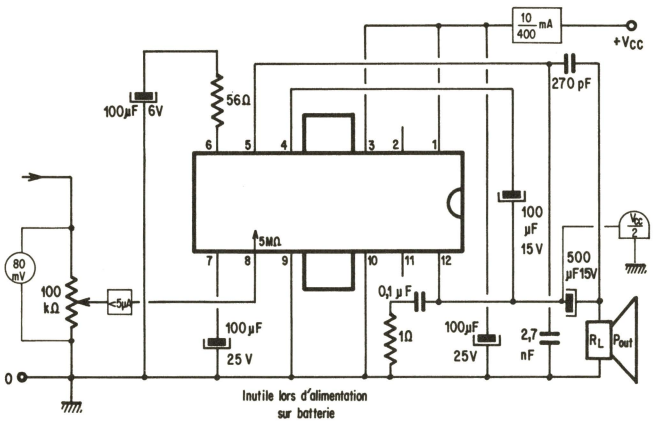
* TBA 900 : Pour tuners équipés de transistors PNP

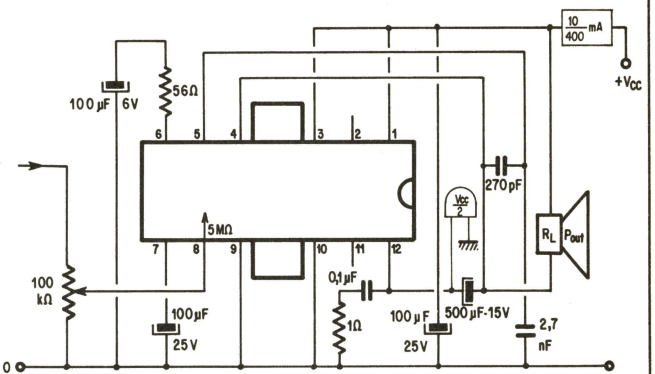
B.F. Puissance 1,3 à 5W

TBA 800 C

ITT - Telefunken - SGS-Ates
Fairchild - Sescosem

GV = 42 dB
Bande 40Hz.... 20 kHz
Bruit : 5 µV





V_{CC} (V)	9	12	15	18	18	24
R_L (Ω)	8	8	8	8	16	16
P_{out} (W)	1,3	2	3,5	5	3	5*

* Distorsion 0,5 % jusqu'à 3 W

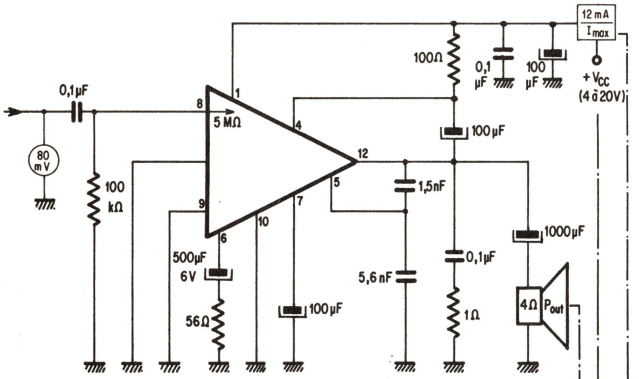
B.F. Puissance 1 à 7 W

Bande : 40 Hz à 10 kHz
Distorsion : 0,3 % (P_{out} ≤ 3W, V_{CC} = 14,4V)
Bruit à l'entrée : 2 µV

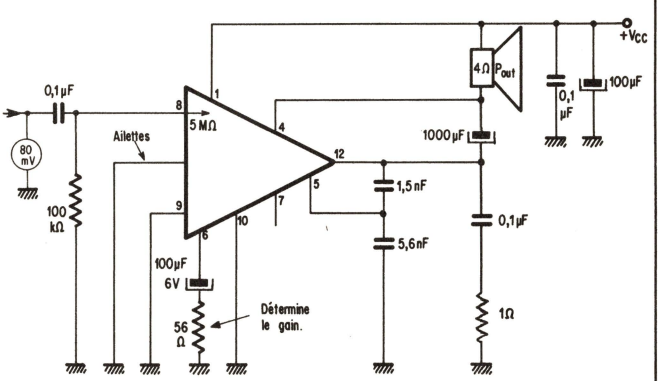
Radiateur 30 °C/W

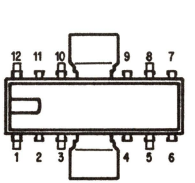
TBA 810 S
TBA 810 AS

Telefunken_SGS-Ates
Fairchild_Sescosem

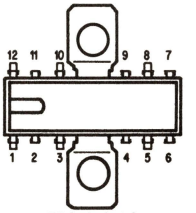


P_{out} (W)	7	6	2,5	1
V_{CC} (V)	16	14,4	9	6
I_{max} (A)	0,65	0,65	0,5	0,5





TBA 810 S

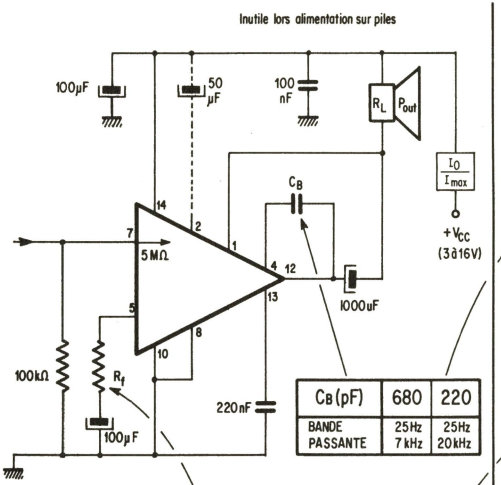


TBA 810 AS

B.F. Puissance 0,2 à 2 W

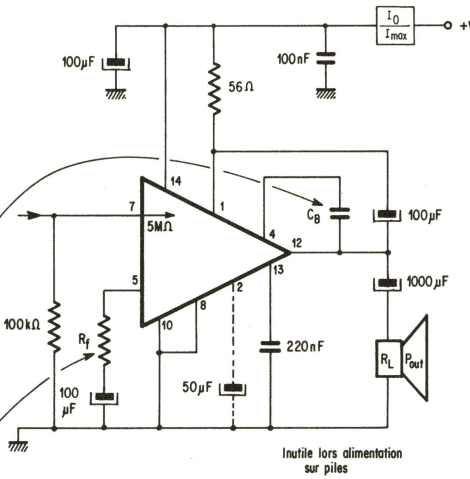
TBA 820

SGS-Ates-Sescosem

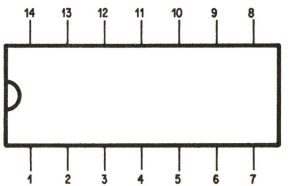


C_B (pF)	680	220
BANDE PASSANTE	25Hz 7kHz	25Hz 20kHz

Valeur de R_f (Ω)	33	120
GAIN EN TENSION (dB)	45	34
DISTORSION A 0,5W (V_{CC}=9V)	0,8%	0,4%



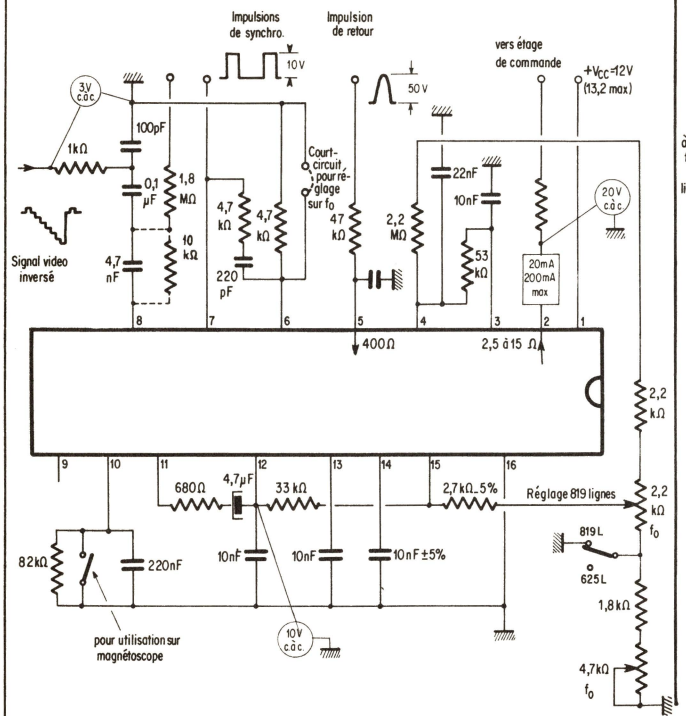
V_{CC} (V)	R_L (Ω)	P_{out} (W)	I_O (mA)	I_{max} (mA)
3,5	4	0,22	2,5	80
6	4	0,75	3,5	130
9	8	1,2	4	200
9	4	1,6	4	270
12	8	2	4,5	250



Oscillateur lignes TV

TBA 920

RTC _ Fairchild

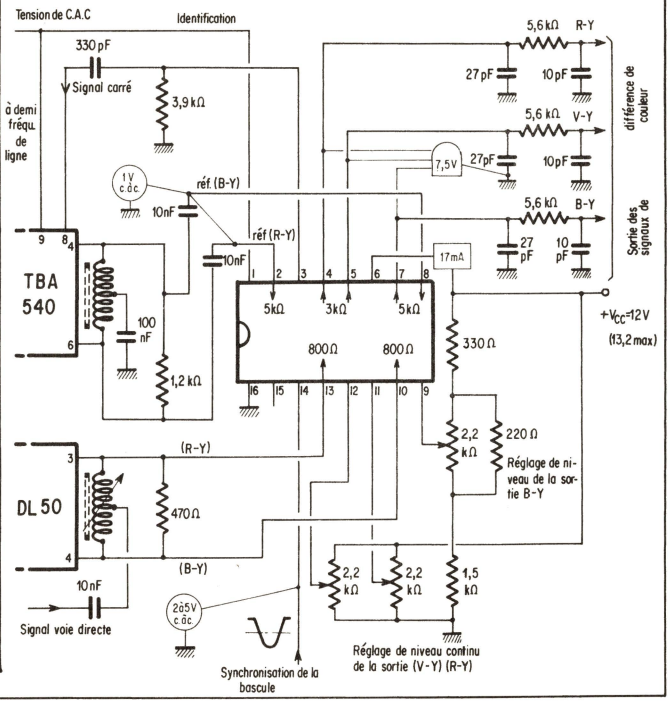


Démodulateur synchrone PAL

Gain R-Y=3,8
Gain B-Y=6,7

TBA 990

Telefunken_Fairchild

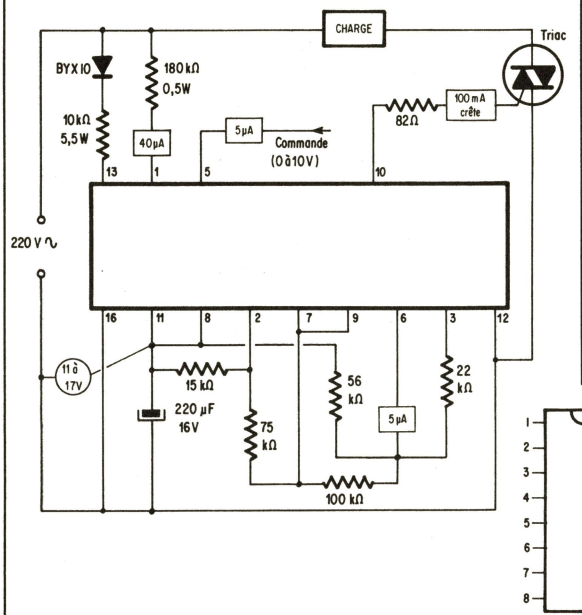


Commande Triac

TCA 280 A

RTC

Commutateur marche-arrêt
(passage au zéro)

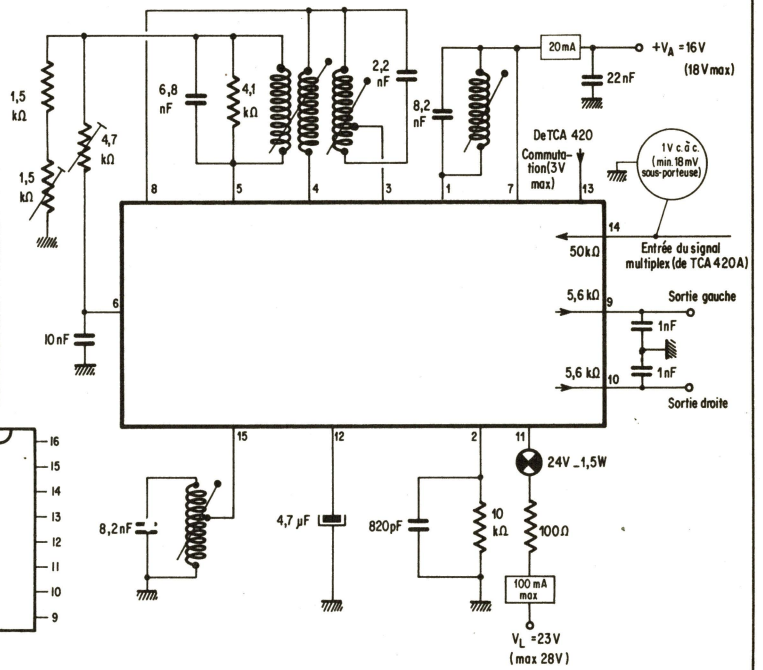


Décodeur Stéréo multiplex

TCA 290 A

RTC

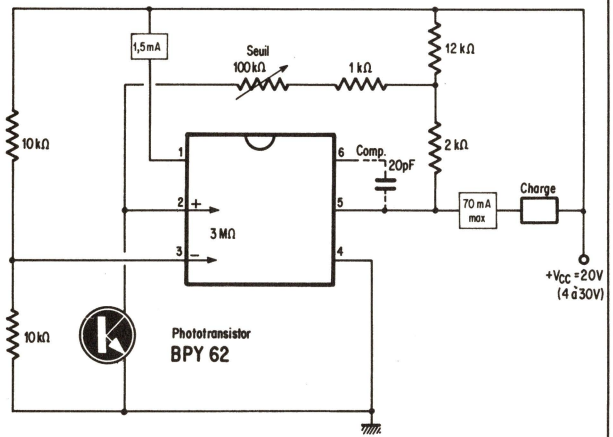
Distorsion : 0,2 %
Séparation canaux : 40 dB



Amplif. opérationnel

TCA 331 A

Siemens

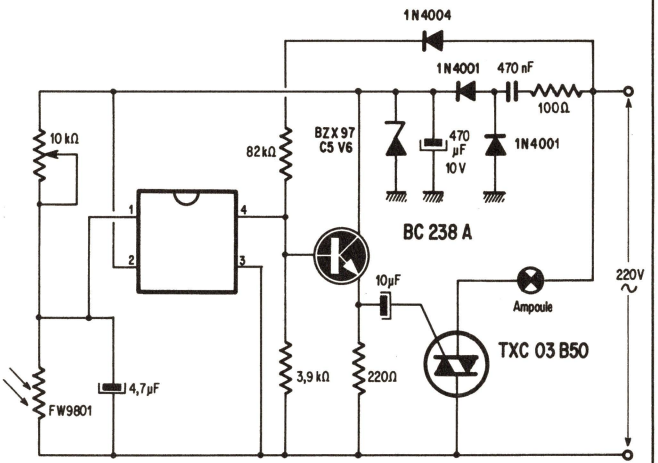


TRIGGER COMMANDÉ PAR PHOTOTRANSISTOR

Commutateur de seuil

TCA 345 A

Siemens



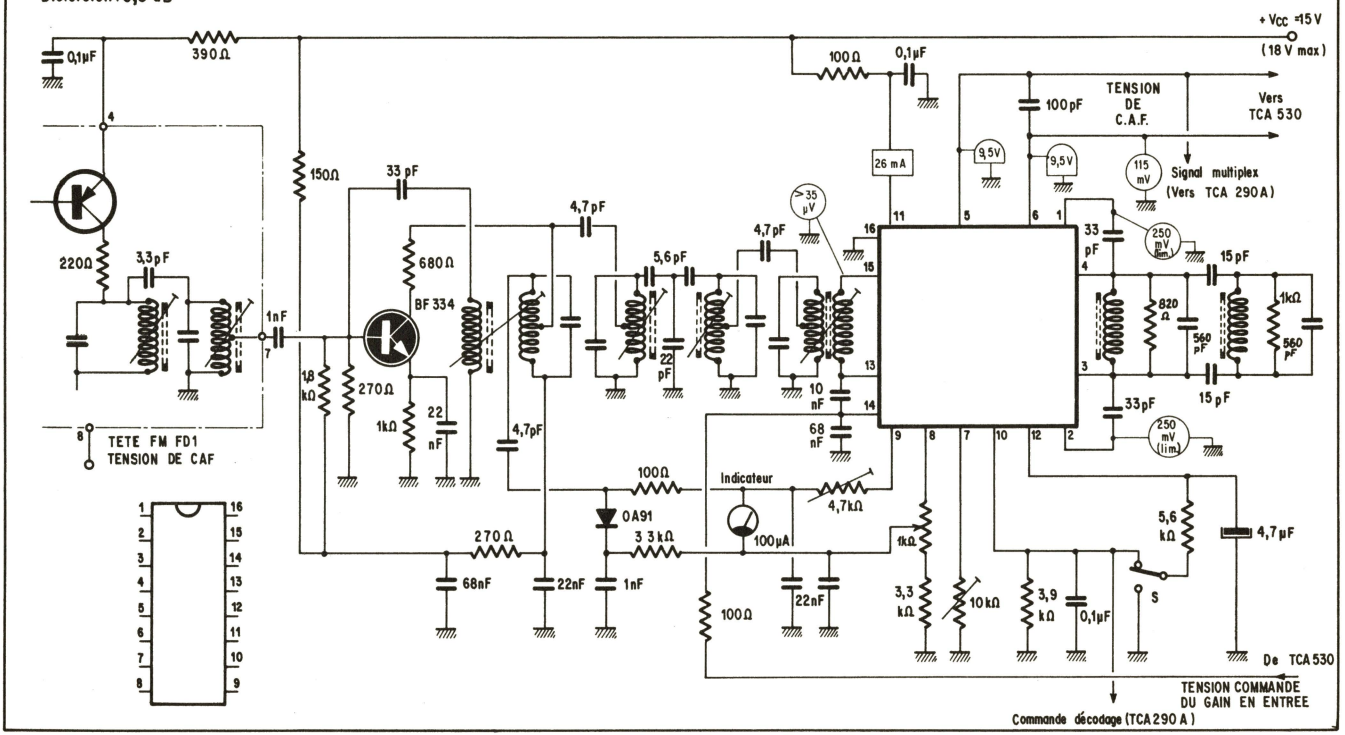
COMMANDE DE TRIAC PAR PHOTORÉSISTANCE

Amplif.-Démodulateur FI-FM

Réjection AM: 50 dB - Gain FI: 65 dB
Distorsion: 0,8 dB

TCA 420 A

RTC

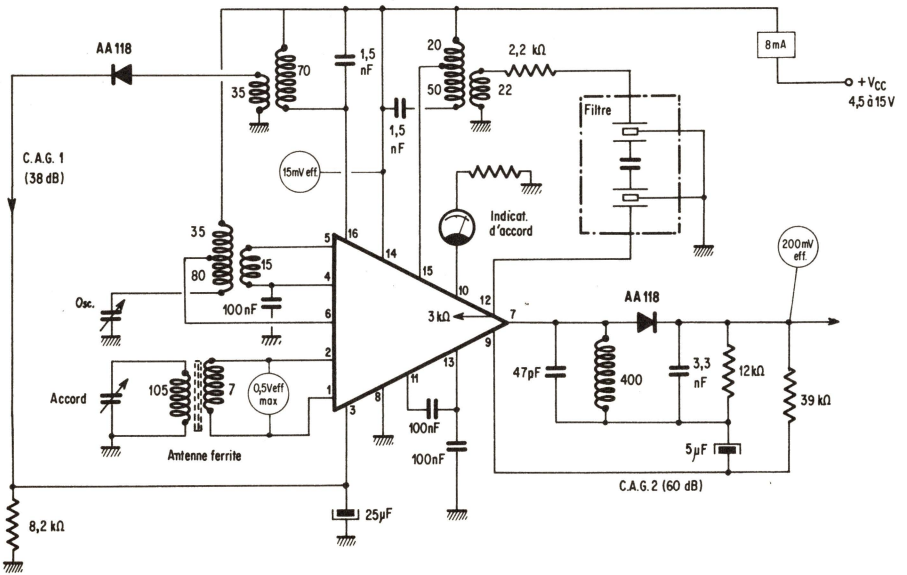


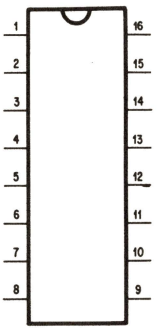
Radioréception A.M.

C.A.G. 38+60 dB
< 50 MHz

TCA 440

Siemens_RTC_Signetics



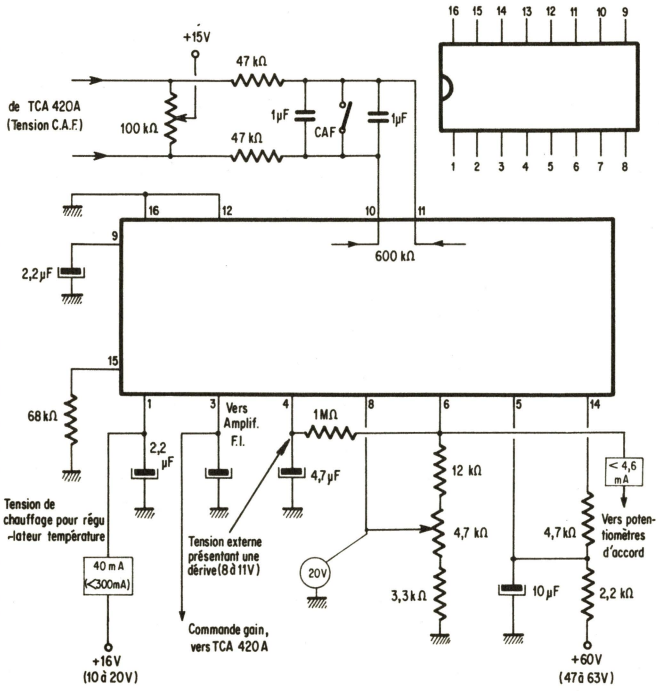


Alimentation ajustable

TCA 530

RTC

30 V, pour varicap
Bruit en sortie ≤ 50 µV

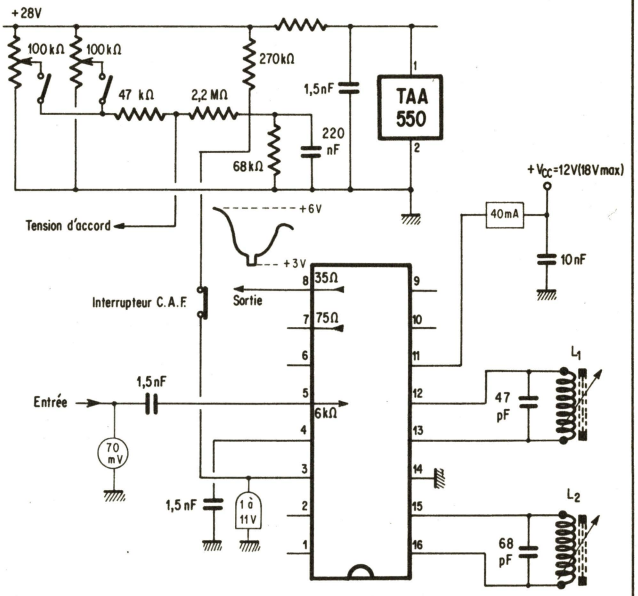


Démodulateur synchrone TV

TCA 540

RTC

C.A.F. - Bande : 5 MHz
Intermodulation < 52 dB

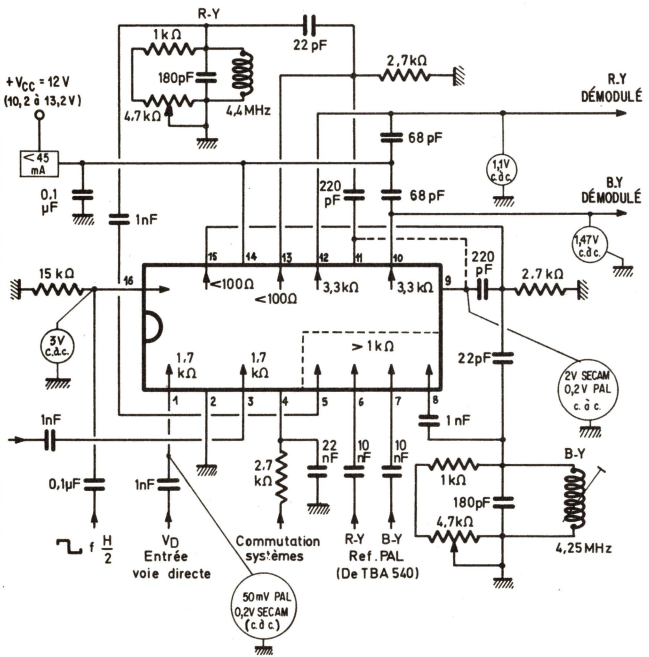


Démodulateur couleurs

SECAM / PAL

TCA 650

RTC

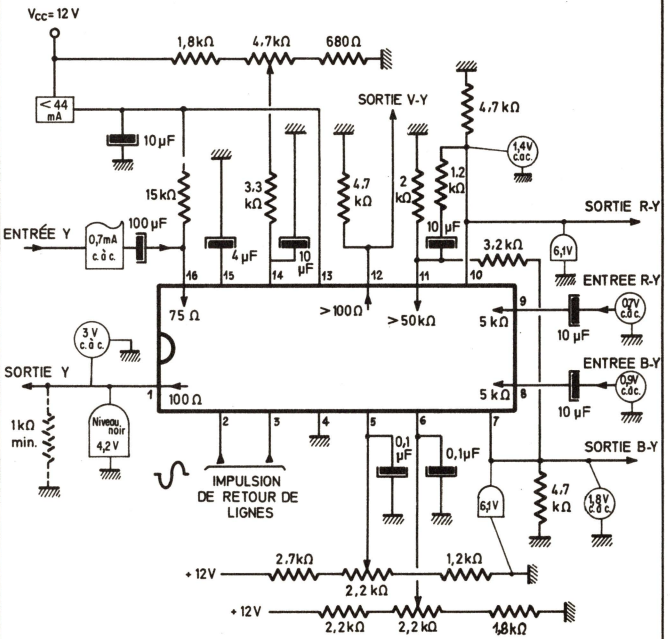


Commande luminance-chrominance

SECAM/PAL
Bande 6 MHz

TCA 660

RTC

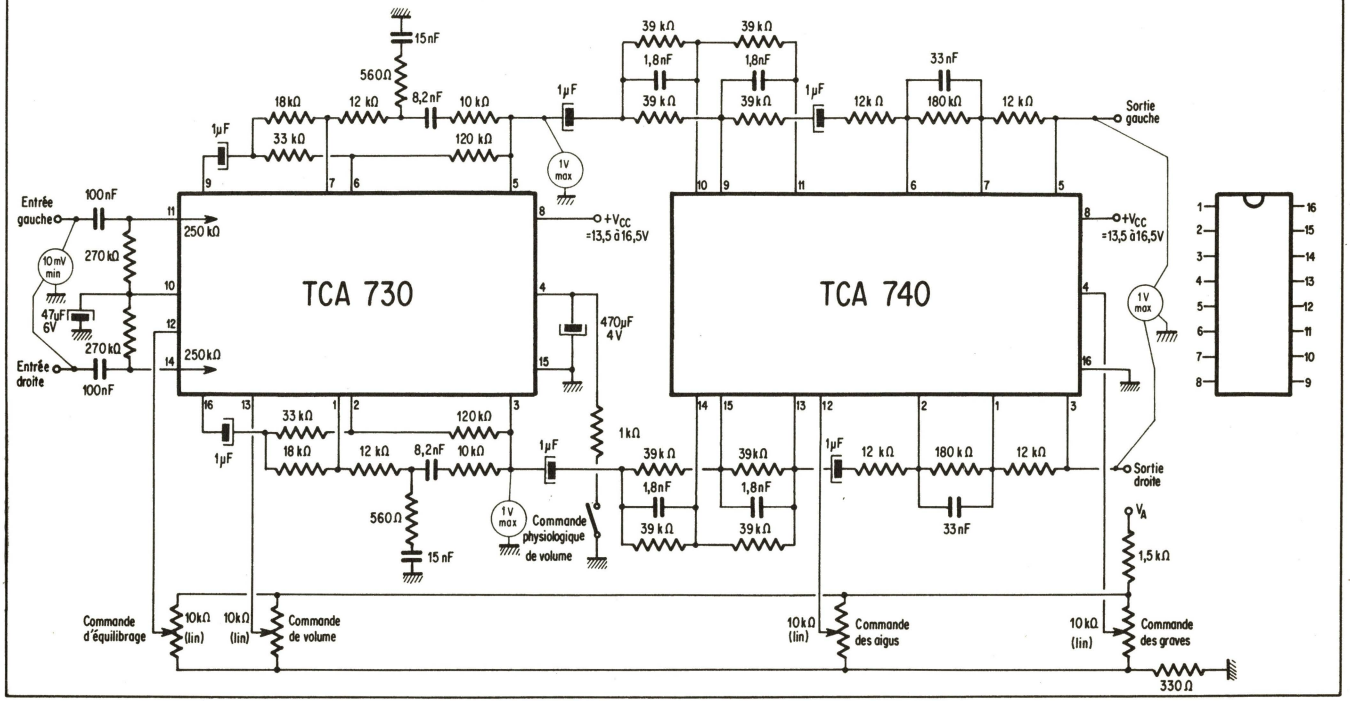


Commande volume (90 dB) TCA 730

Commande tonalité
(±15 dB à 40 Hz et à 15 kHz) TCA 740
Distorsion: 0,1%

TCA 730-TCA 740

RTC



Multistabilisateur

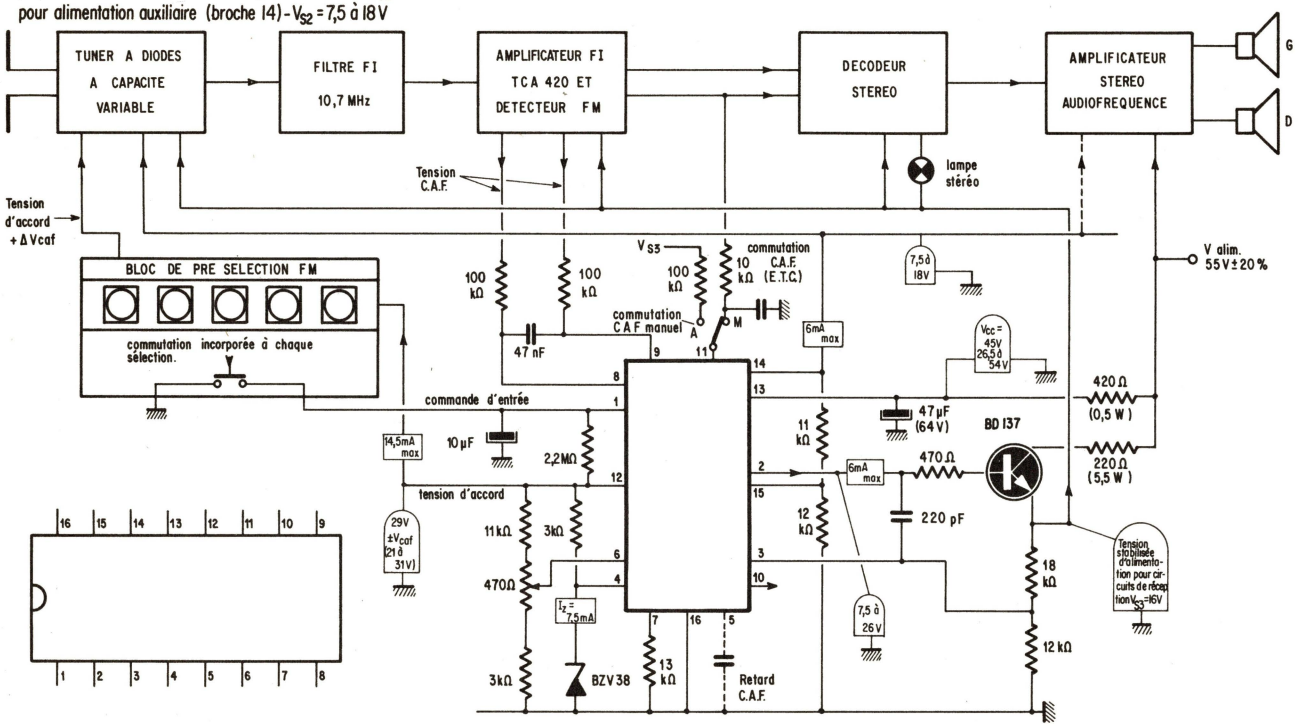
pour accord électronique (broche 12)

pour alimentation des circuits du récepteur (broche 2) - V_{S3} = 16 V

pour alimentation auxiliaire (broche 14) - V_{S2} = 7,5 à 18 V

TCA 750

RTC

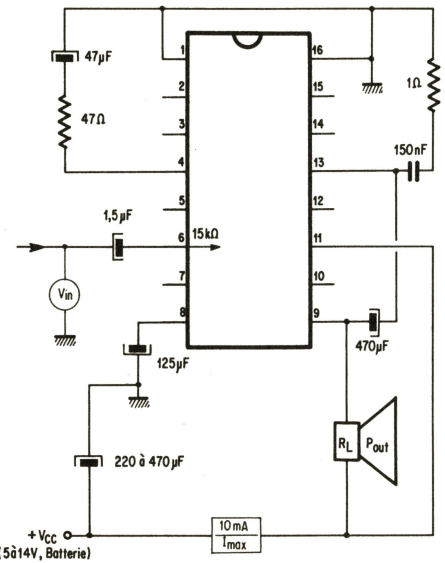


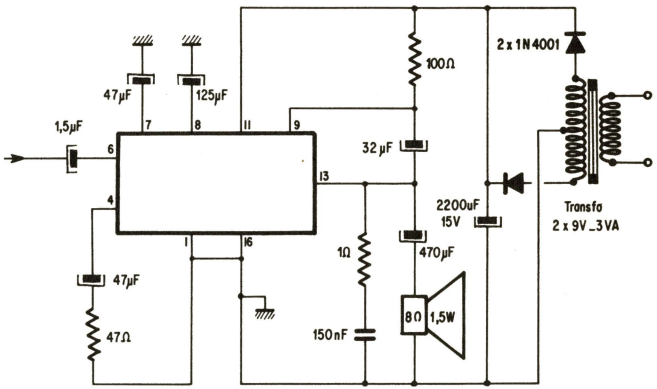
B.F Puissance 0,5 à 2 W

Gain en tension : 50 dB
Bruit à l'entrée: < 3µV

TCA 760 B

RTC





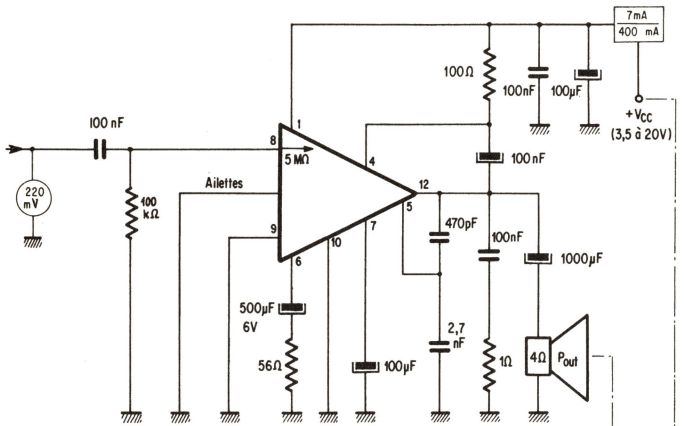
V_{CC} (V)	6	6	7,5	7,5	9	9	10	12
R_L (Ω)	4	8	4	8	4	8	8	8
P_{out} (W)	0,62	0,46	1	0,78	1,4	1,1	1,45	2
I_{max} (mA)	185	125	225	165	300	190	215	250
V_{in} (mV)	4,8	7	8	9	10	10	11	12

B.F. Puissance 2 à 3,2 W

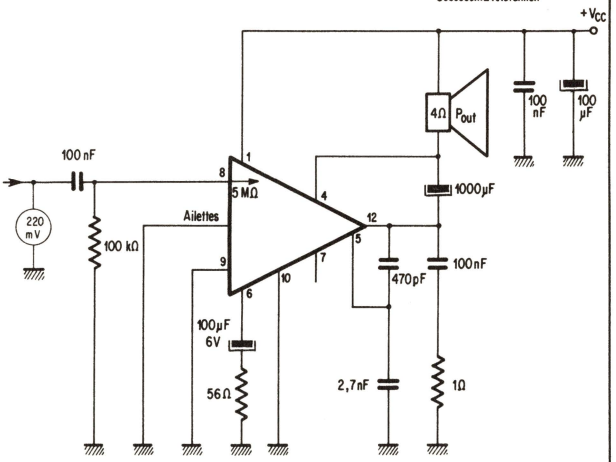
Gain: 37 dB

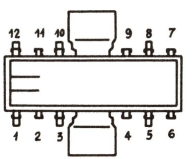
TCA 830
TCA 830 A

Sescosem_Telefunken

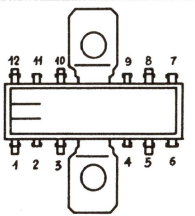


P_{out} (W)	3,2	2
V_{cc} (V)	12	9





TCA 830



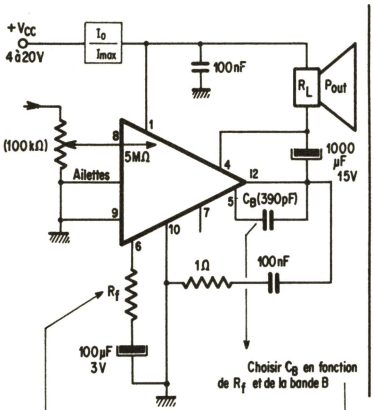
TCA 830 A

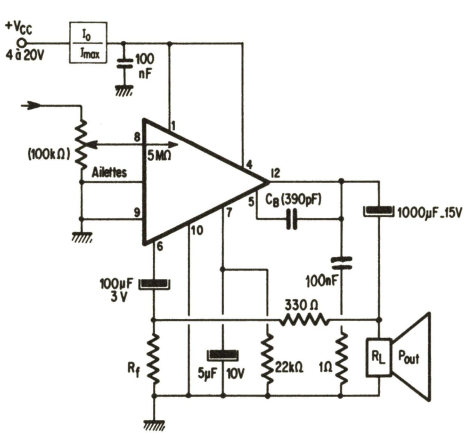
B.F. Puissance 0,8 à 4,2 W

Distorsion : 0,3 % entre 50 mW et 2 W
pour V_{CC} = 12 V, R_L = 4 Ω, f = 1 kHz

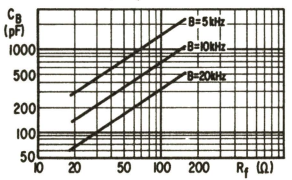
TCA 830 S

SGS-Ates _ Sescosem



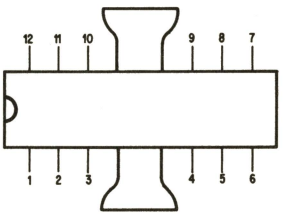


Valeur de R_f	Gain en tension
22 Ω	100
100 Ω	40
200 Ω	20



RADIATEUR :
Surface cuivrée de 25 cm²

V_{CC} (V)	R_L (Ω)	P_{out} (W)	I_o (mA)	I_{max} (mA)
6	4	0,8	6,5	220
9	4	2	8,5	330
12	8	2,3	10	300
12	4	3,4	10	430
14	4	4,2	11	450

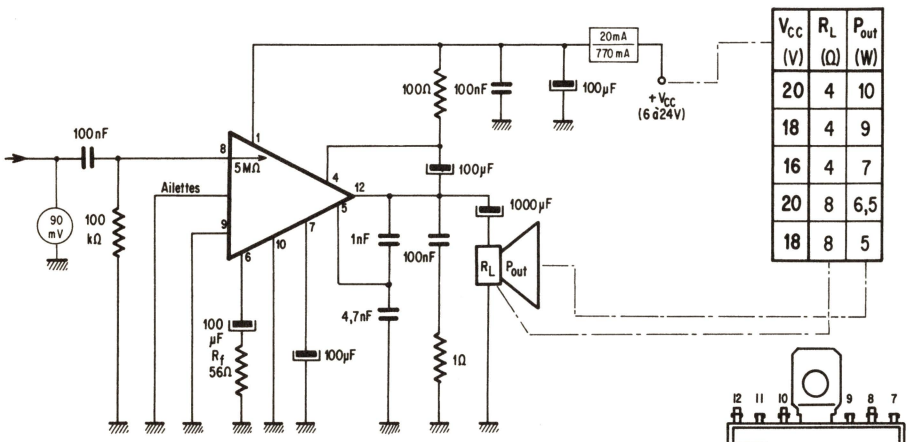


B.F. Puissance 5 à 10 W

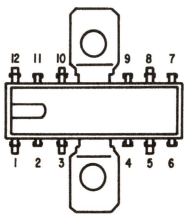
TCA 940

Telefunken_ SGS-Ates
Sescosem

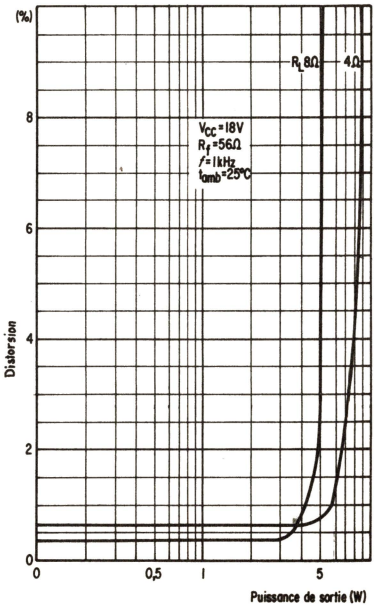
Dissipation 8 W à 70°C au boîtier
Bande : 40 Hz à 20 kHz
Distorsion : 0,3 % ($P_{out} \leq 5W$, $V_{CC} = 18V$, $R_L = 4\Omega$)



V_{CC} (V)	R_L (Ω)	P_{out} (W)
20	4	10
18	4	9
16	4	7
20	8	6,5
18	8	5



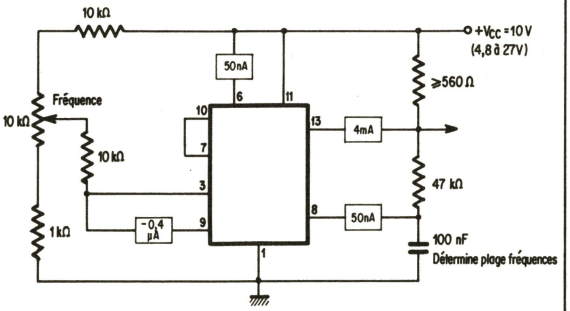
TCA 940 E : utilisable seulement avec $R_L \geq 8\Omega$



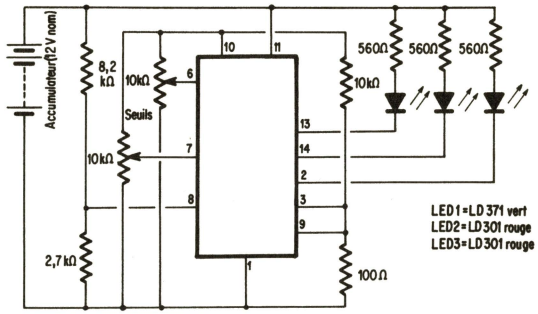
Comparateur double seuil

TCA 965

Siemens



MULTIVIBRATEUR 91 Hz .....1 kHz

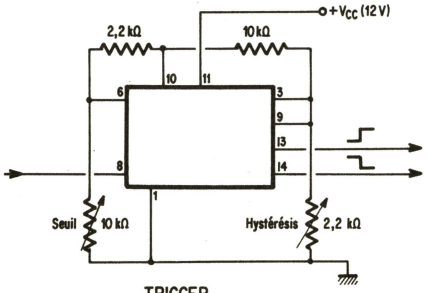


SURVEILLANCE ACCUMULATEUR

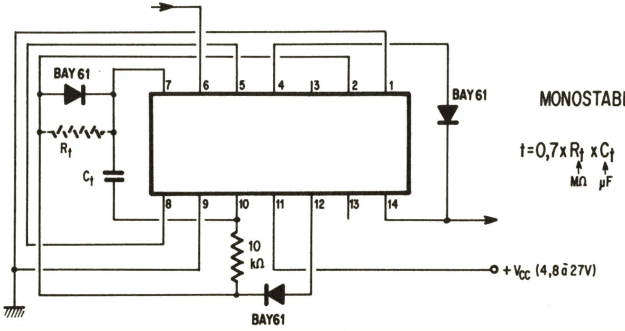
Vert : 11,5 à 14,5 V. charge normale

Rouge : < 11,5 décharge

> 14,5 surcharge



TRIGGER



MONOSTABLE

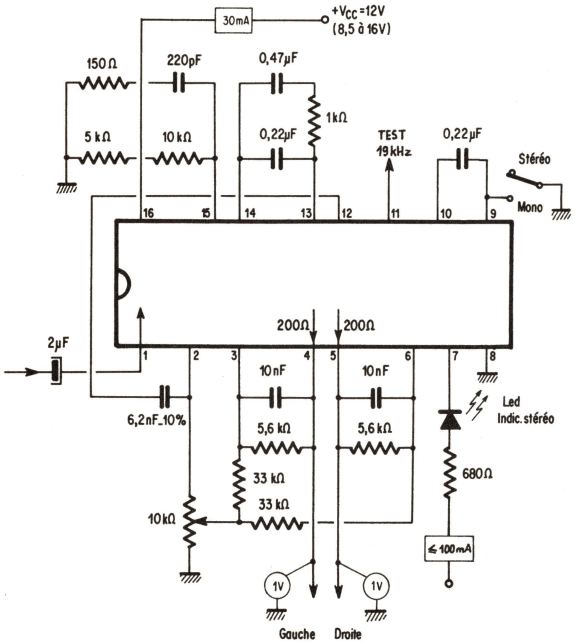
$t = 0{,}7 \times R_t \times C_t$ (R_t en MΩ, C_t en µF)

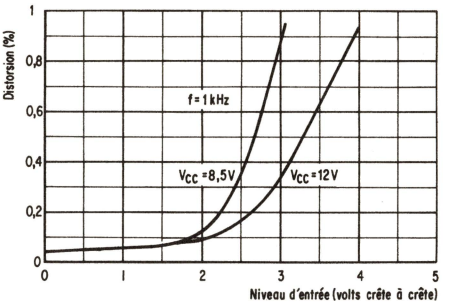
Décodeur stéréo FM

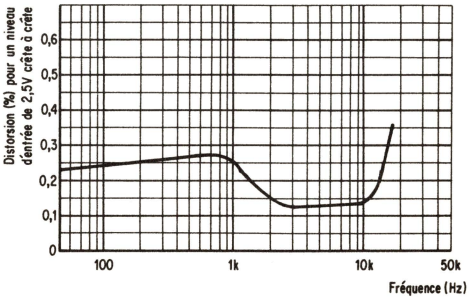
TCA 4500

Motorola

Distorsion : 0,1 %
Rapport signal / bruit : 80 dB





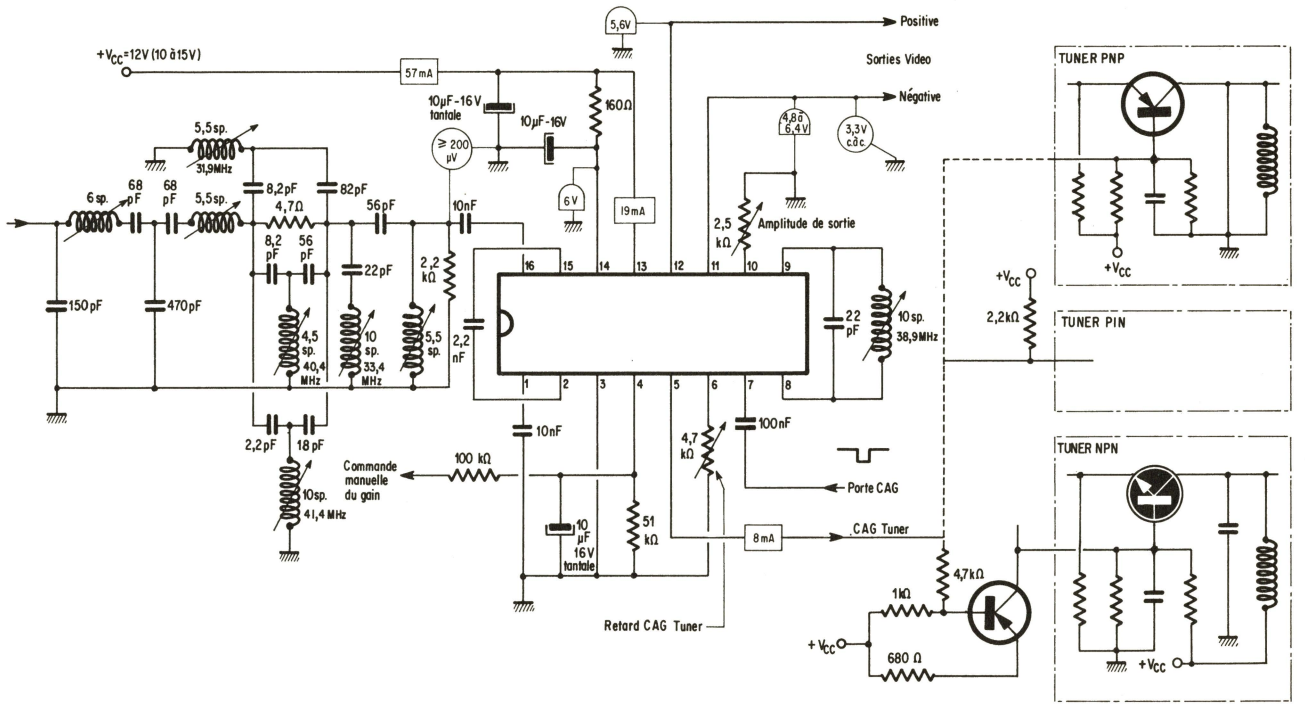


Amplif. F.I. - Démodulateur

Video - TV - C.A.G = 55 dB - Bande : 10 MHz

TDA 440

SGS - Ates



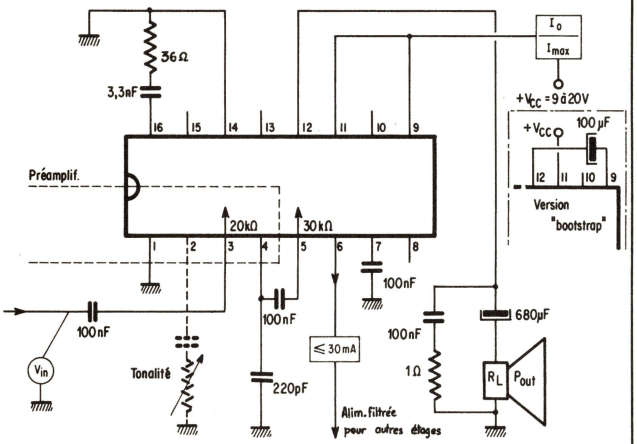
Préamplif + Amplif. B.F. Puissance 5 à 11 W

Distorsion < 0,2 % à ≤ 2 W

Bruit à la sortie : < 0,5 mV

TDA 1004 A

RTC



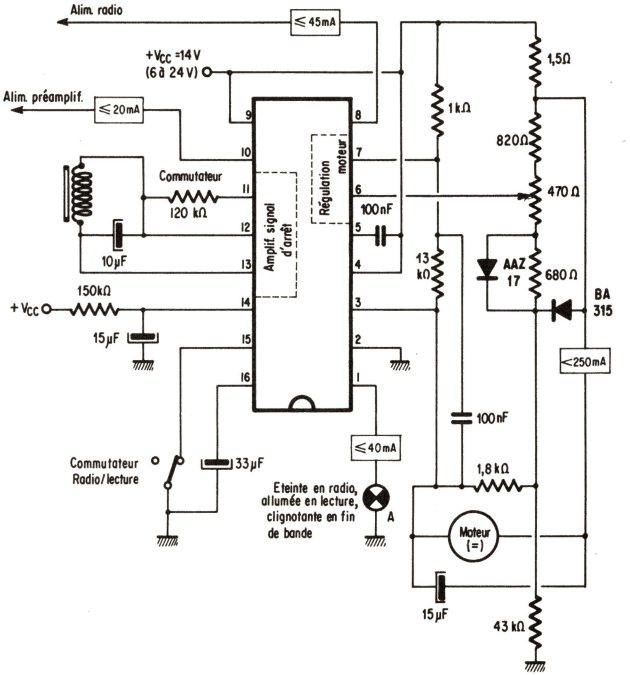
V_{CC} (V)	14	14	14	20	20
R_L (Ω)	2	4	8	4	8
P_{out} (W)	7,5	5	3	11	6
P_{out} (W) *	9**	6	3,5	12	7
I_o (mA)	30	30	30	40	40
I_{max} (A)	1	0,6	0,35	0,85	0,5
V_{in} (mV)	4,8	6,6	9,1	6,6	9,1

* Version "bootstrap" ** Avec 220 Ω entre 9 et 11

Commande radiocassette

TDA 1006

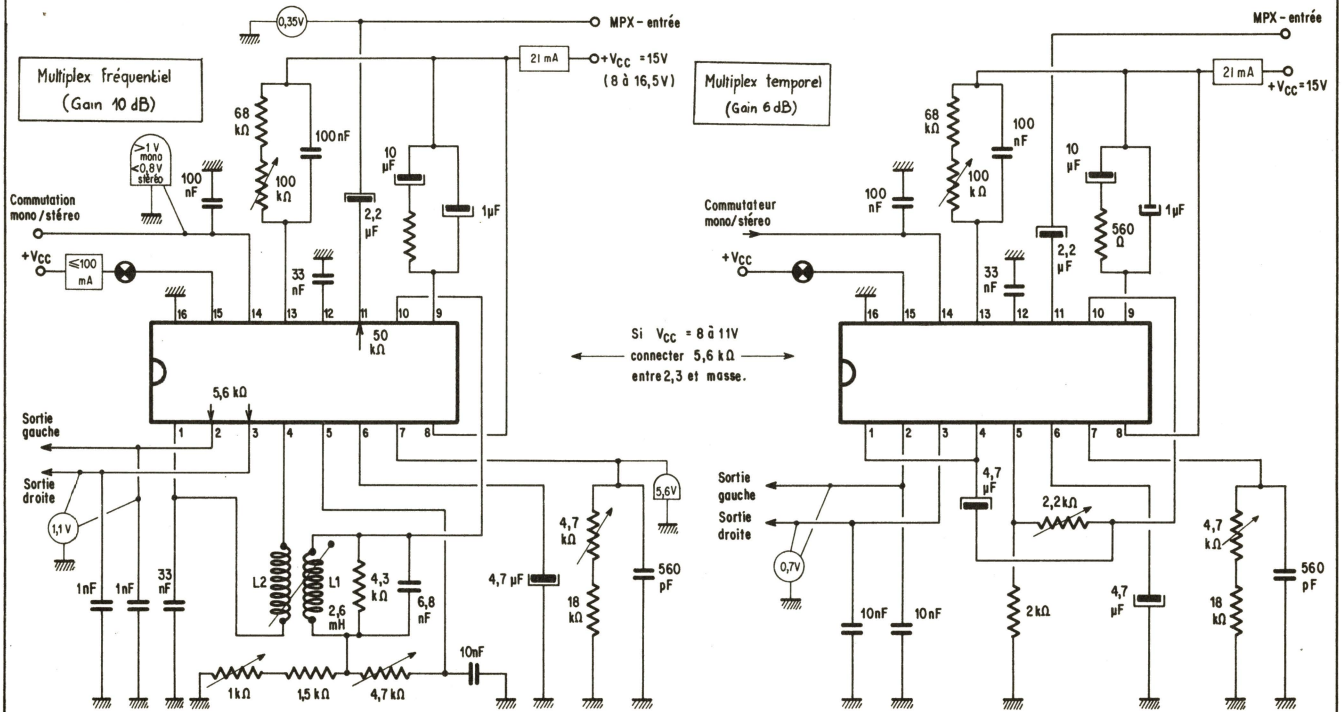
RTC



Décodeur stéréo multiplex

Séparation canaux 45 dB
Distorsion 0,2 %

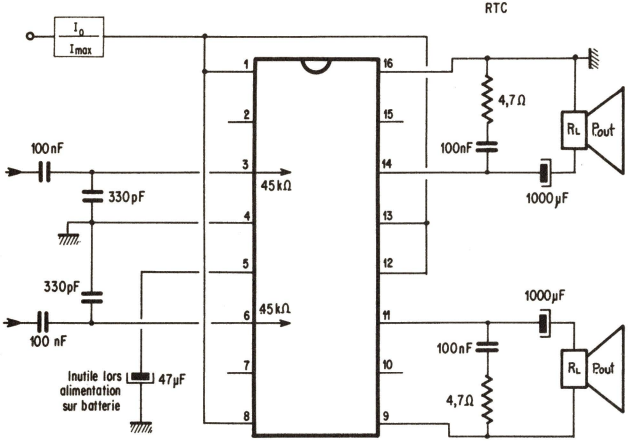
TDA 1005
RTC



B.F. Puissance stéréo 2 x 0,8 à 5,7 W

TDA 1009

RTC



Version "bootstrap" : Supprimer les connexions entre 1, 8, et $+V_{CC}$. Connecter 100µF entre 1 et 14 (+ sur 14) et entre 8 et 11 (+ sur 11).

* Version "bootstrap"

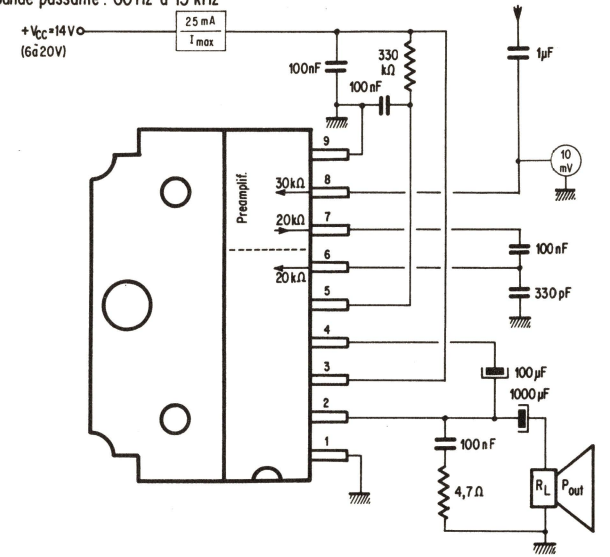
V_{CC} (V)	9	9	12	12	14	14	16	16	20
R_L (Ω)	4	8	4	8	4	8	4	8	8
P_{out} (W)	1,5	0,8	3,1	1,7	4,4	2,5	6	3,4	5,7
P_{out} (W)*	2	1,2	4	2,2	5,5	3,1	7,1	4,1	6,6
I_o (mA) total	35	35	43	43	47	47	52	52	61
I_{max} (mA) total	450	350	900	500	1000	600	1250	700	850
V_{in} (mV)	23	32	23	32	23	32	23	32	32
Dist. à 2,5W (%)			3		0,65	10	0,4	0,35	0,15

B.F. Puissance 3 à 6 W

TDA 1010

RTC

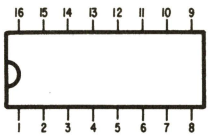
Distorsion : 0,3 % pour ≤ 3 W _ Bruit à la sortie : < 1 mV
Gain préamplificateur : 24 dB _ Gain amplificateur : 30 dB
Bande passante : 60 Hz à 15 kHz



R_L (Ω)	P_{out} (W)	I_{max} (A)
2	6	2
4	6	1,4
8	3,3	0,8

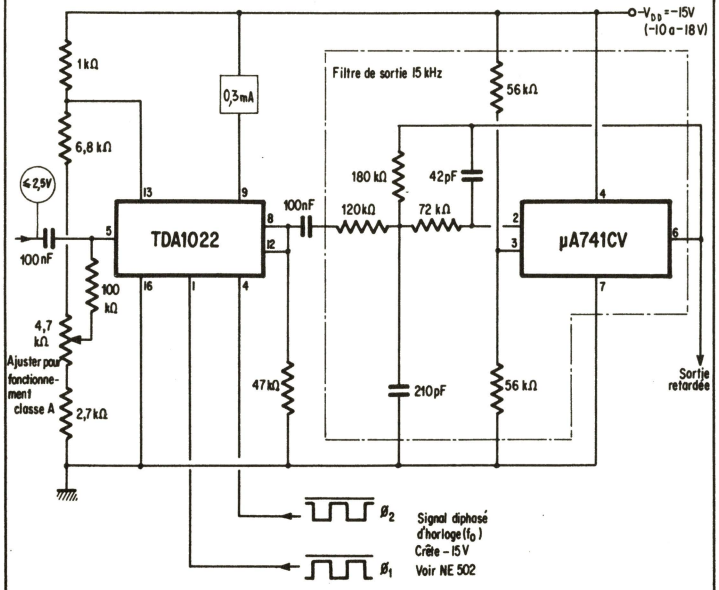
Ligne à retard analogique BBD

Retard : $512/2 f_0$ (0,51 à 51 ms)
f_0 : 5 à 500 kHz. Signal : 0 à 45 kHz
$f_{signal} < 0,5 f_0$
Atténuation : 3 dB

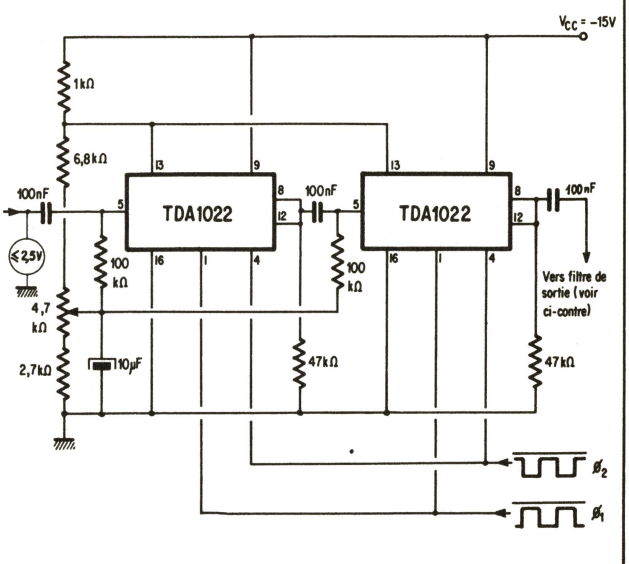


TDA 1022

RTC



RETARD PAR UN SEUL TDA 1022



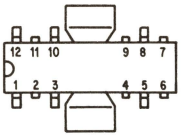
MISE EN CASCADE DE DEUX TDA 1022

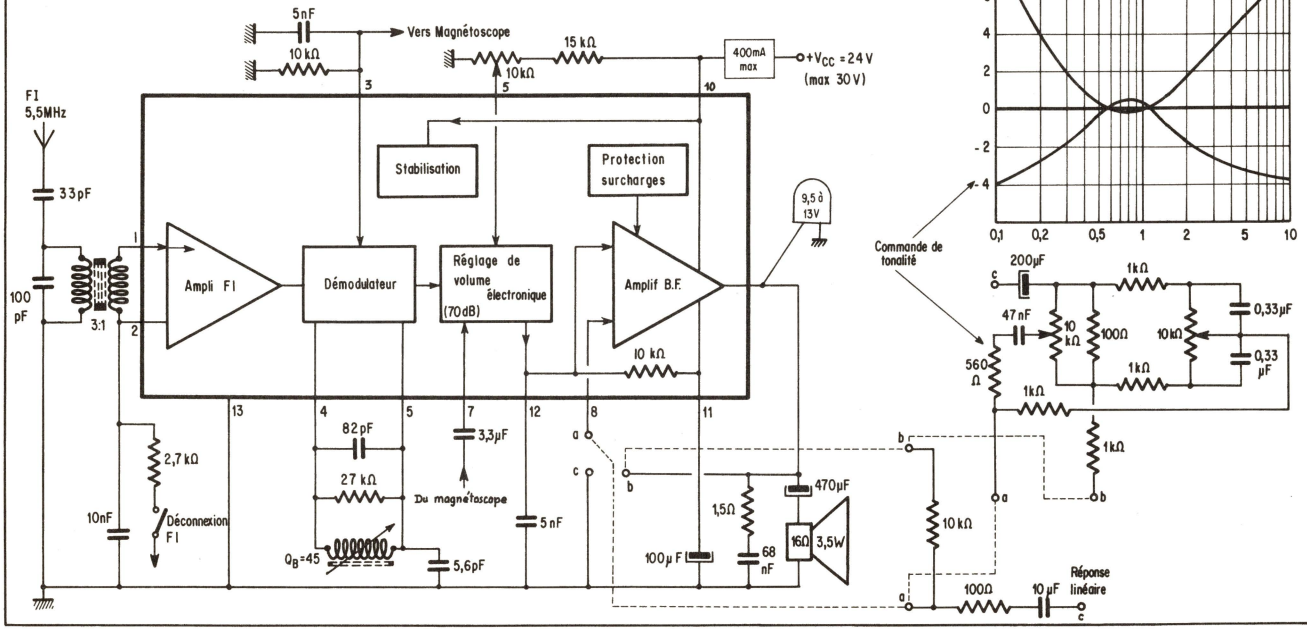
Voie son TV

F.I._Démodulation F.M._Commande gain
Amplificateur puissance (GV=40 dB max entre connexions 7 et 9)

TDA 1035

ITT



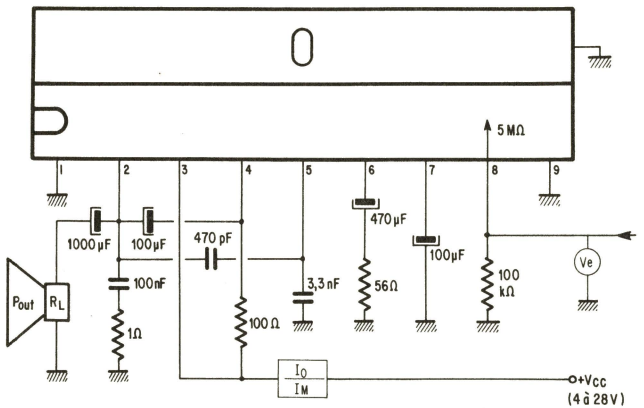


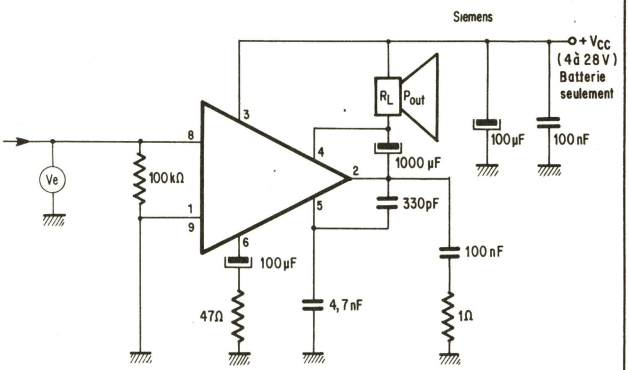
B.F. Puissance 5W

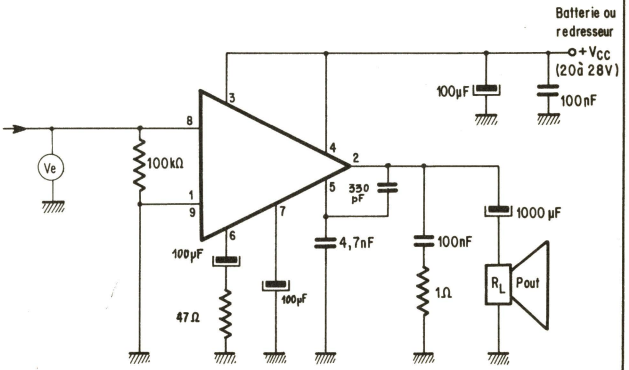
Gain 36 dB _ Distorsion > 1% à 5 W
35 Hz à 20 kHz

TDA 1037

Siemens







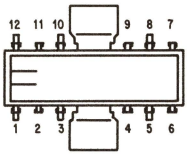
Po (W)	RL (Ω)	Io (mA)	IM (A)	Vcc (V)	Ve (mV)
5,5	16	15	0,35	24	150
5	8	13	0,45	18	110
5	4	12	0,55	14	80

Déviation verticale TV (110°)

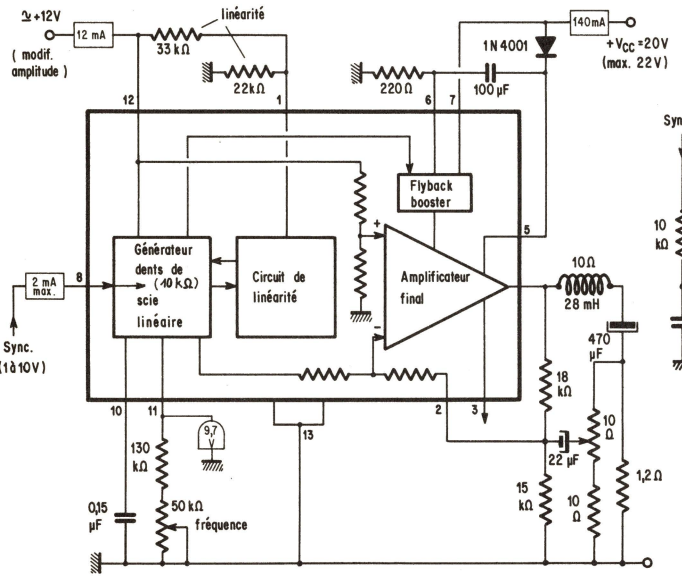
Durée retour 1 ms

TDA 1044

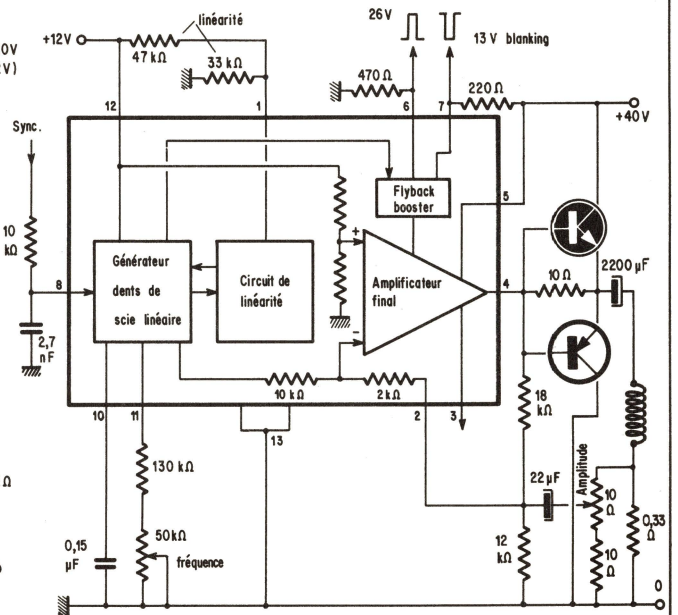
ITT



NOIR ET BLANC



COULEURS



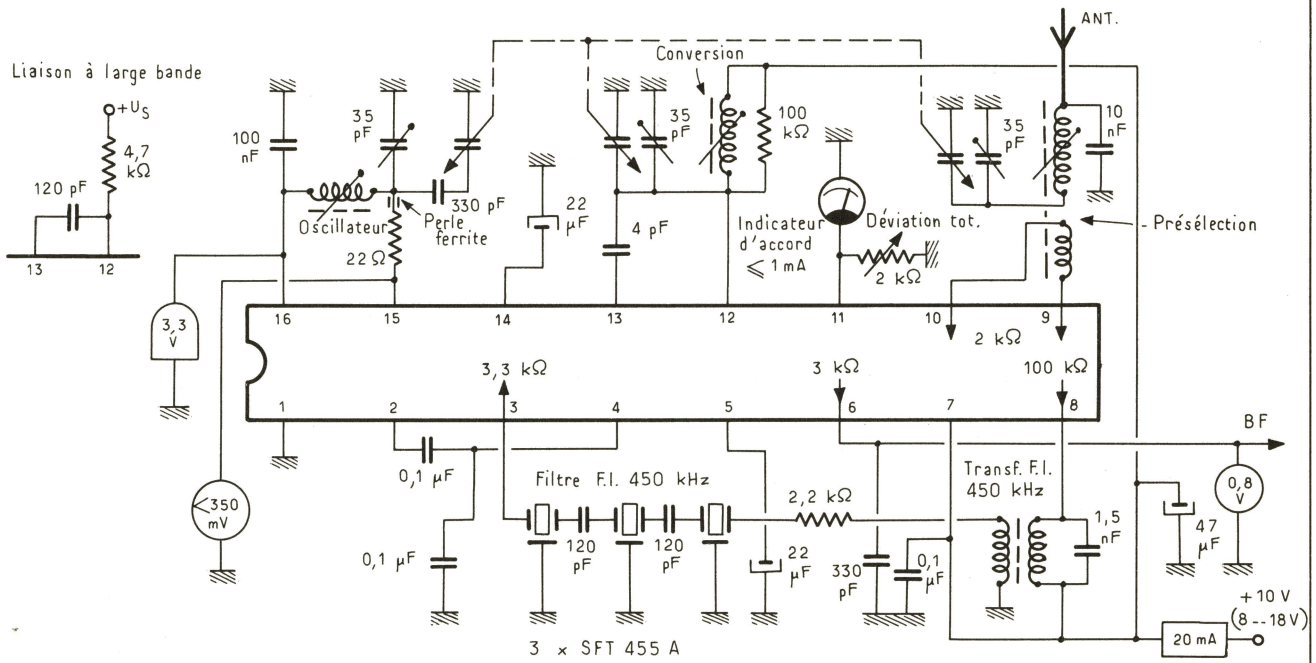
Réception AM < 30 MHz

Régulation 85 dB

Sensibilité : 14 µV

TDA 1046

Siemens

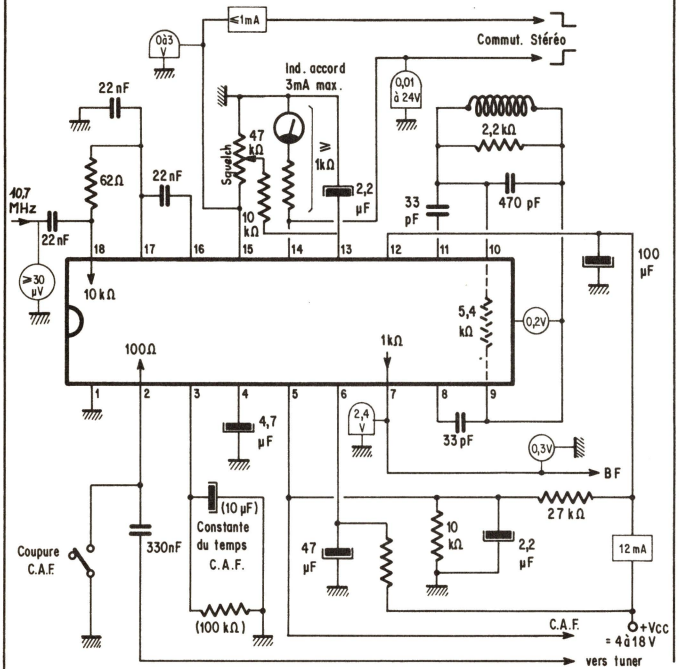


Amplif-démodulateur FM radio ≤ 15 MHz

Distorsion 0,4 %

TDA 1047

Siemens

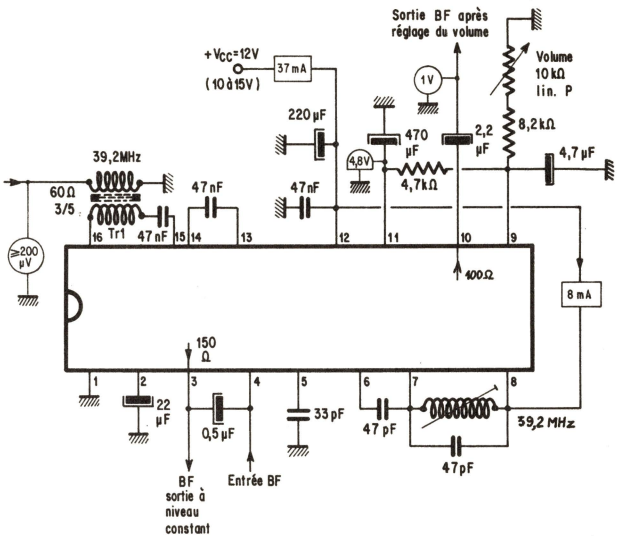


Amplif.-démodulateur Son TV-AM

Commande volume ≥ 70 dB

TDA 1048

Siemens_Sescosem

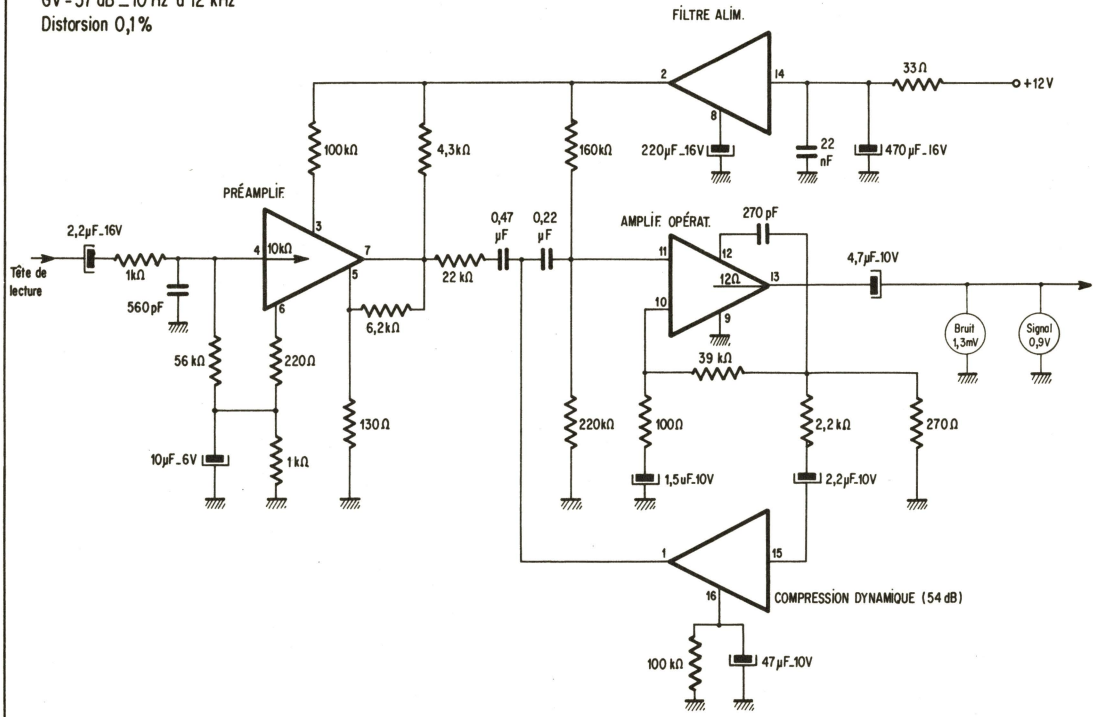


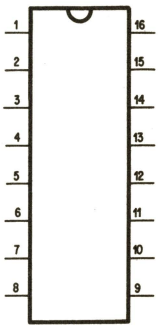
Préamplif. Enregistreur magnétique

Compression de dynamique
GV = 57 dB _ 10 Hz à 12 kHz
Distorsion 0,1 %

TDA 1054

SGS-Ates



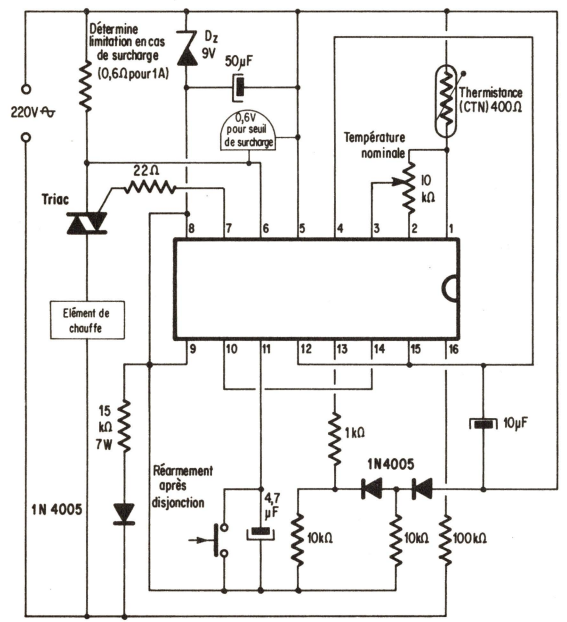


Commande triac

TDA 1067

Sescosem

Régulation proportionnelle de température
Commutation au passage par zéro

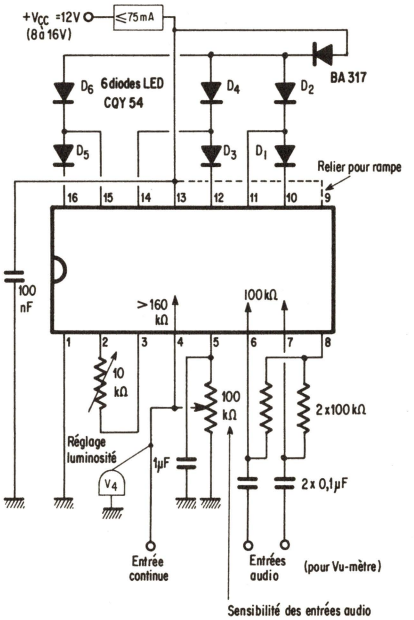


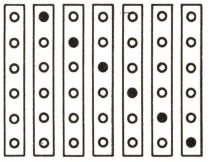
Commande de 6 LED

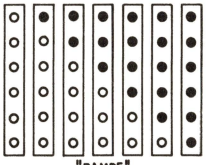
TDA 1069

RTC

Entrées continues et alternatives
Fonctionnement "Spot" ou "Rampe"







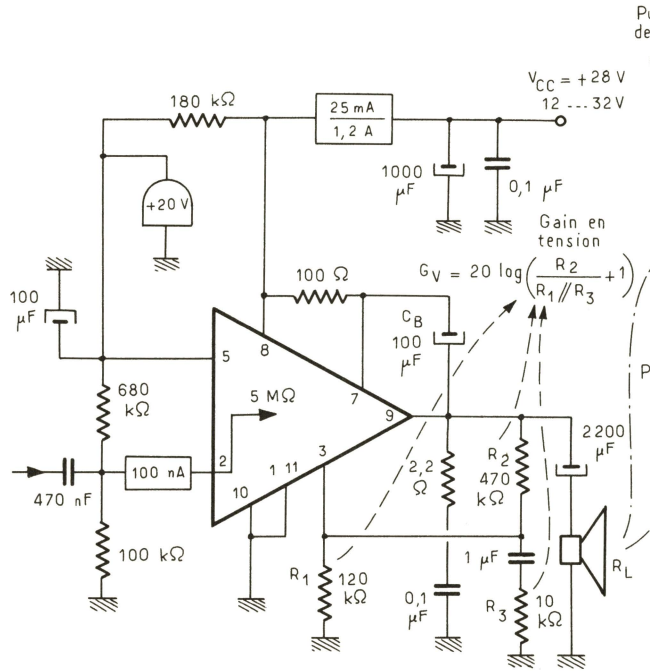
V_4 (V)	Allumage
0,61	D_1
0,80	D_2
1,04	D_3
1,35	D_4
1,75	D_5
2,27	D_6

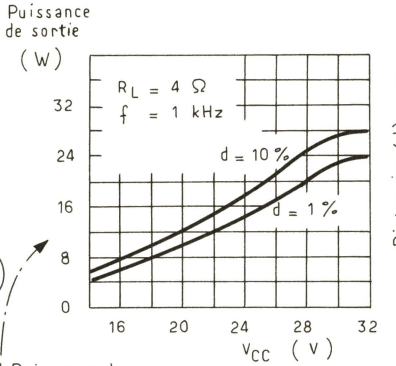
B.F. Puissance 4 à 28 W

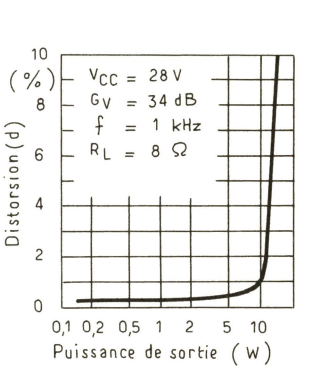
Bruit d'entrée 3 μV

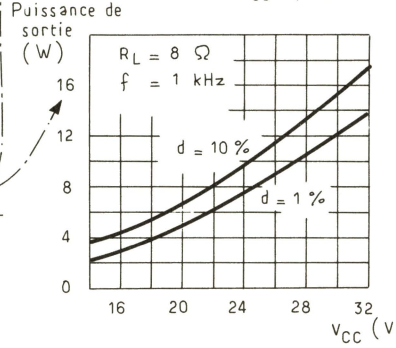
TDA 1102

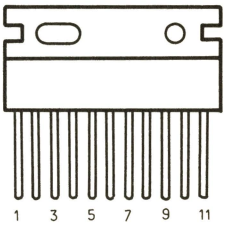
Sescosem







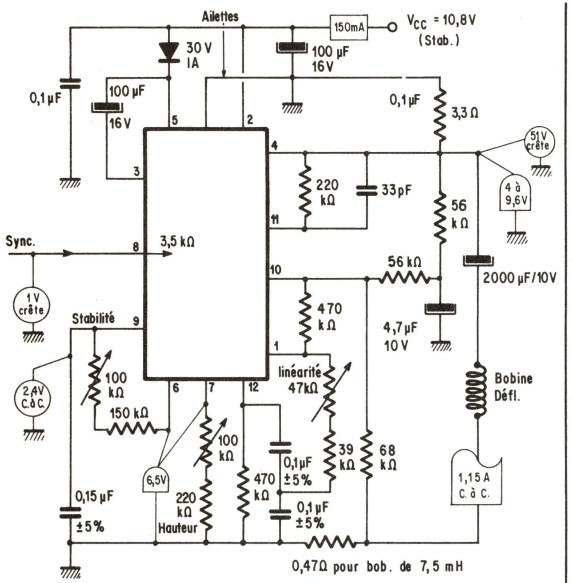




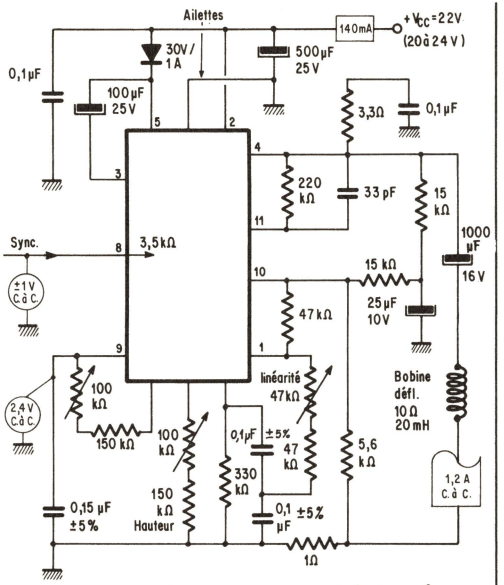
Déviation verticale TV

TDA 1170

SGS-Ates

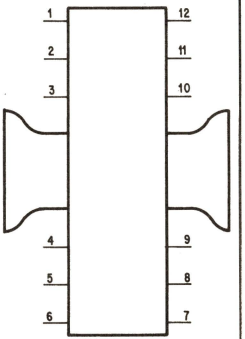


TÉLÉVISEUR PORTABLE



Dissipation 2,2 W Radiateur : surface cuivrée de 5 cm^2

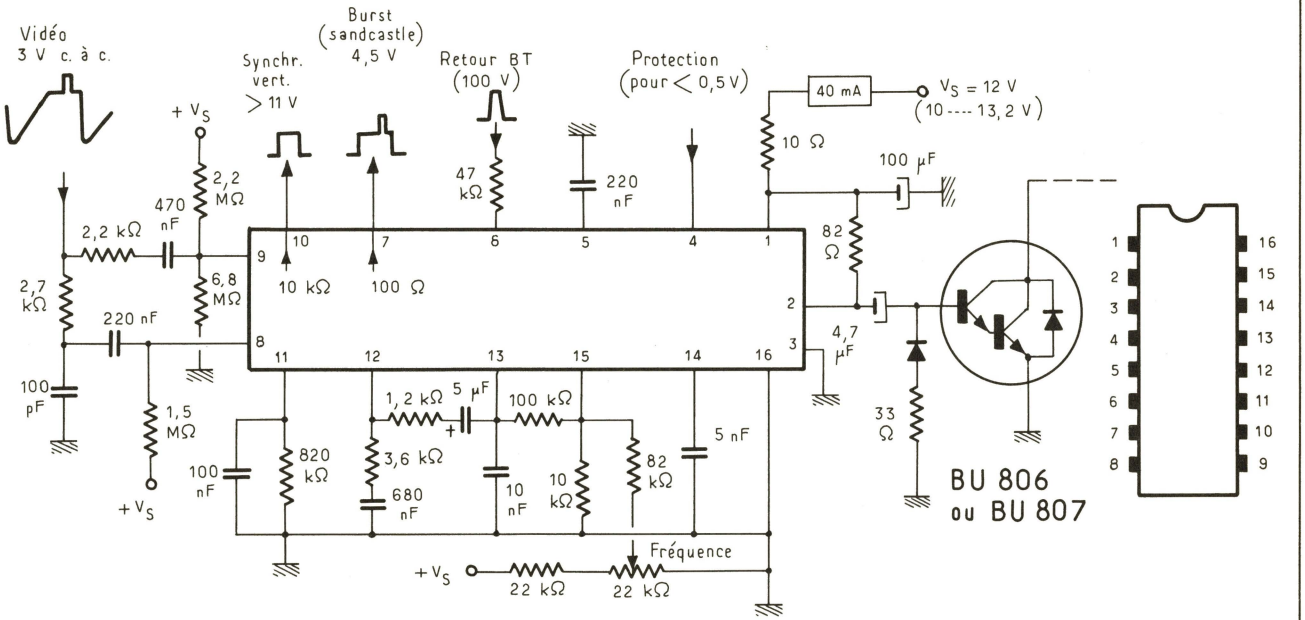
TÉLÉVISEUR DOMESTIQUE



Synchronisation TV

TDA1180 P

SGS

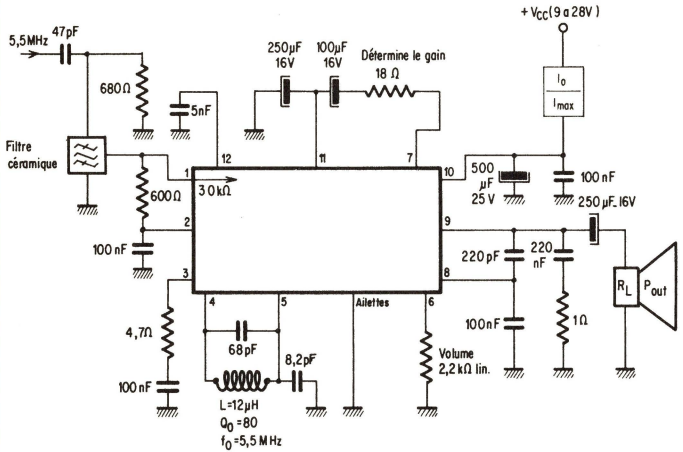


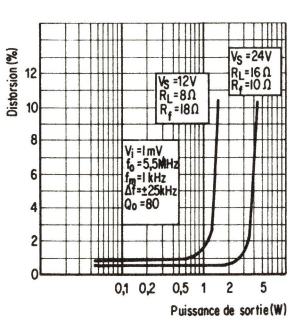
Voie son TV-F.M.

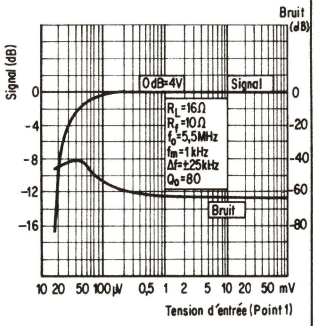
Réjection A.M.: 55 dB

TDA 1190

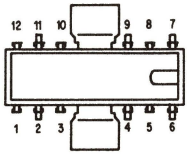
SGS-Ates







V_{CC} (V)	R_L (Ω)	P_{out} (W)	I_o (mA)	I_{max} (mA)
12	8	1,5	19	220
24	16	4,2	22	280

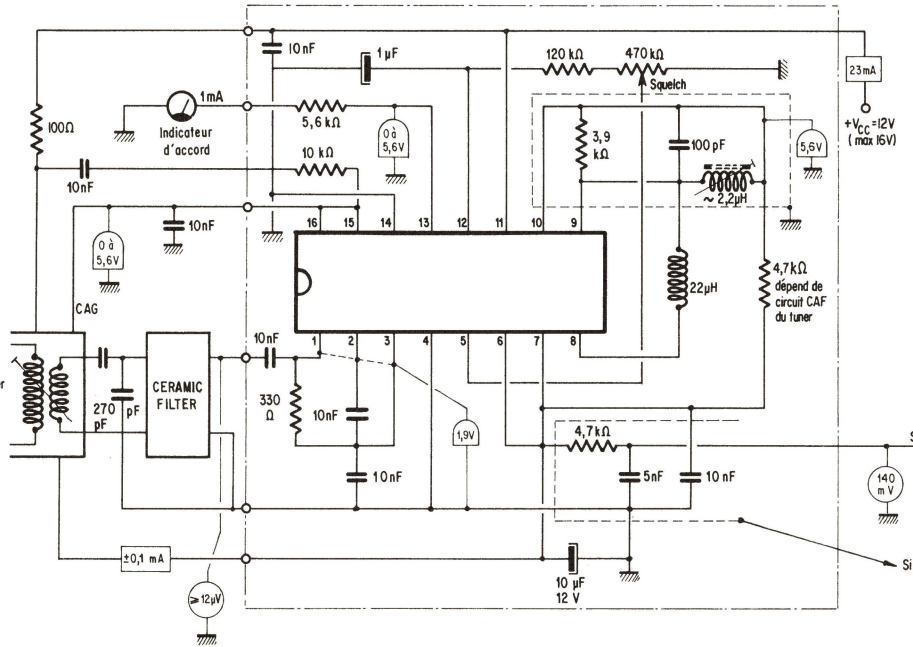


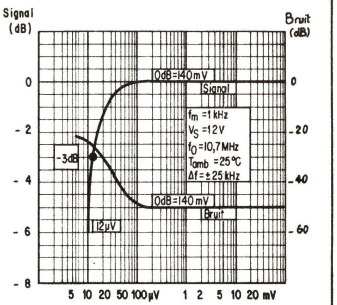
Amplif.-démodulateur F.I-FM

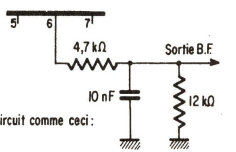
TDA 1200

SGS-Ates

Rejection A.M. : 40 dB _ Rapport signal/bruit : 60 dB
(pour 1 mV à l'entrée)







Si V_{CC} < 12V, modifier ce circuit comme ceci :

Réception AM / FM

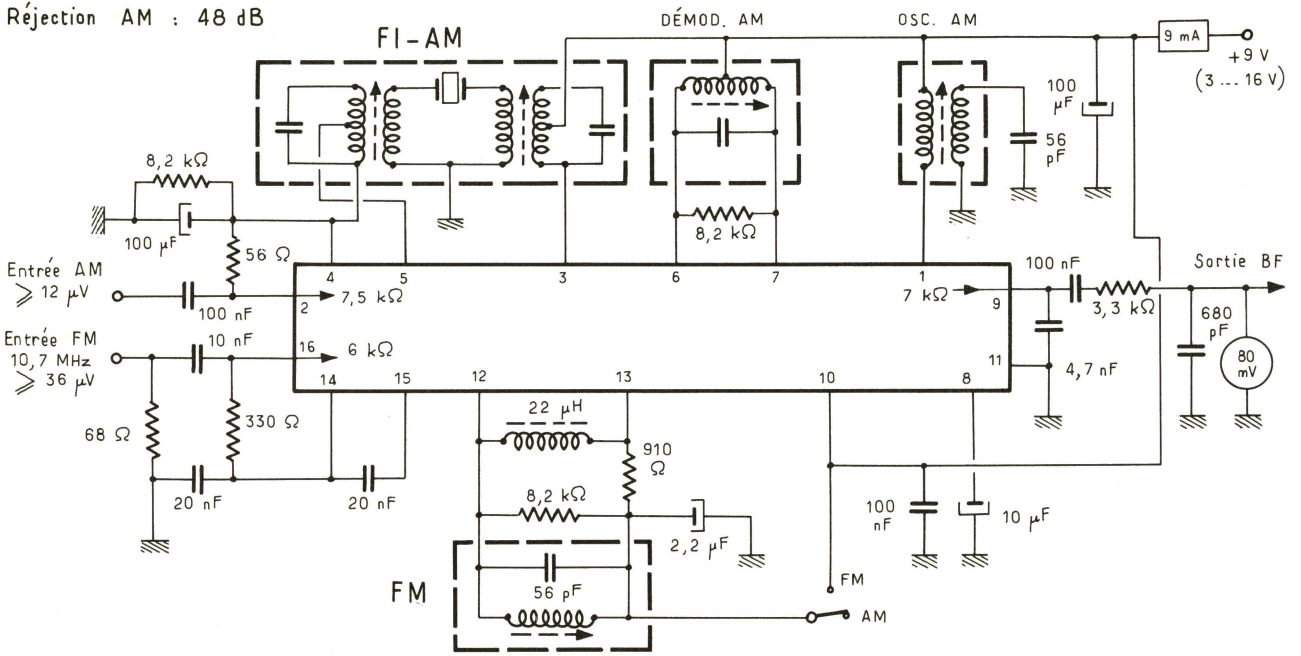
CAG = 80 dB

Distorsion 1 % (AM) 0,7 % (FM)

Réjection AM : 48 dB

TDA1220A

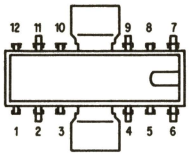
SGS

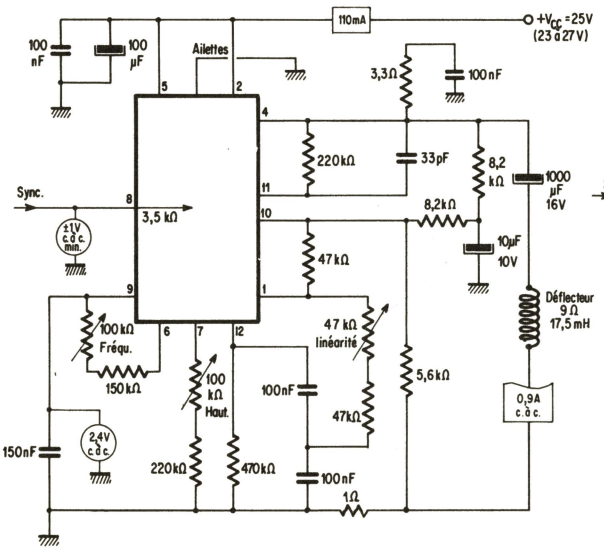


Balayage vertical TV

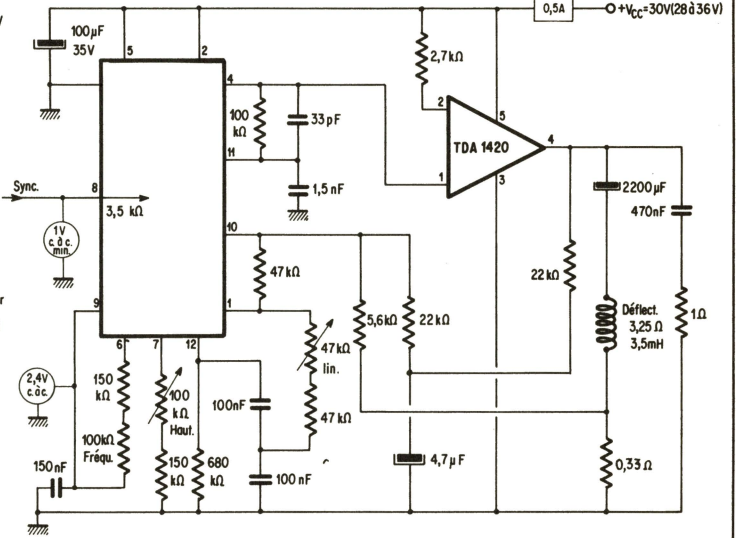
TDA 1270

SGS-Ates





NOIR ET BLANC



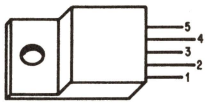
COULEURS

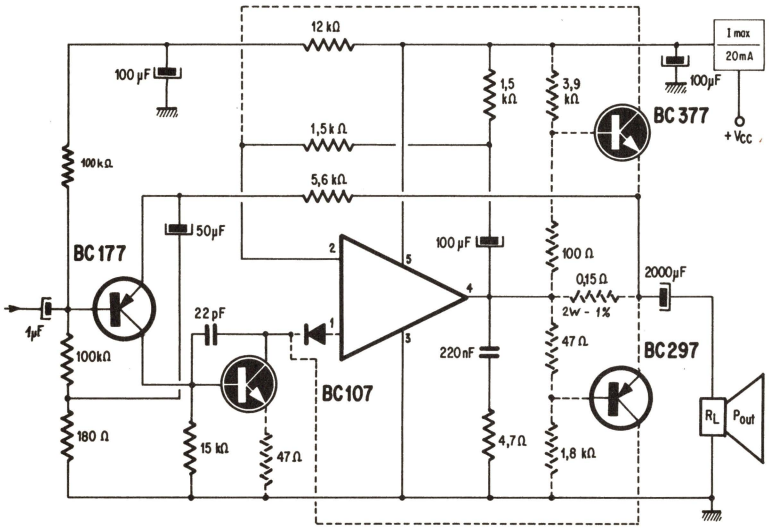
Darlingtons complémentaires B.F. Puissance 12 à 30W

Gain en tension : 30 dB
Bande : 20 Hz à 10 kHz

TDA 1410
TDA 1420

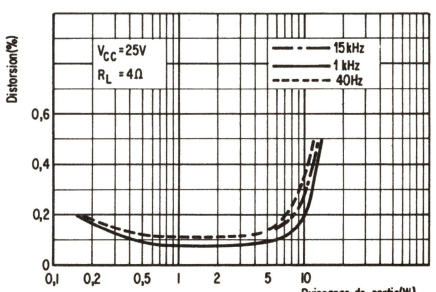
SGS-Ates





En pointillé : Circuit de protection contre court-circuit à la sortie

	TDA 1410		TDA 1420	
V_{CC} (V)	27	25	36	34
R_L (Ω)	8	4	8	4
P_{out} (W)	12	16	20	30
I_{max} (A)	0,58	0,96	0,72	1,3

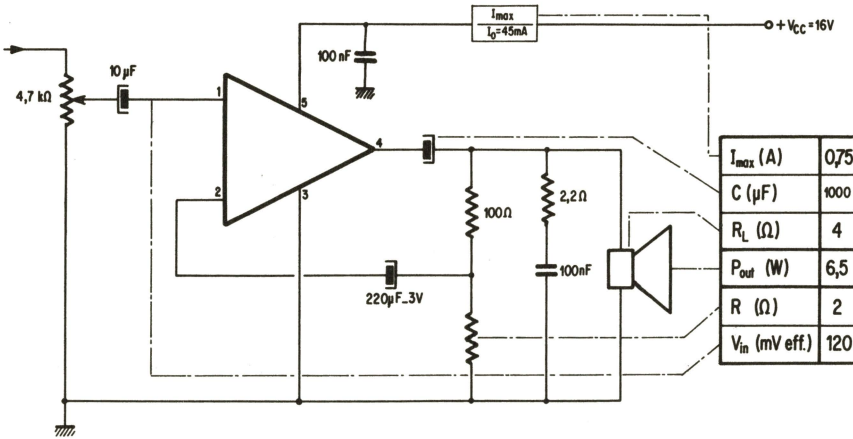


B.F. Puissance 6,5 à 10W

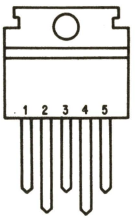
G.V. 80 dB
40 Hz à 15 kHz

TDA 2002

SGS-Ates



I_{max} (A)	0,75	0,75	1,5	1,5
C (µF)	1000	1000	2200	2200
R_L (Ω)	4	4	2	2
P_{out} (W)	6,5	6,5	10	10
R (Ω)	2	1	2	1
V_{in} (mV eff.)	120	60	120	60



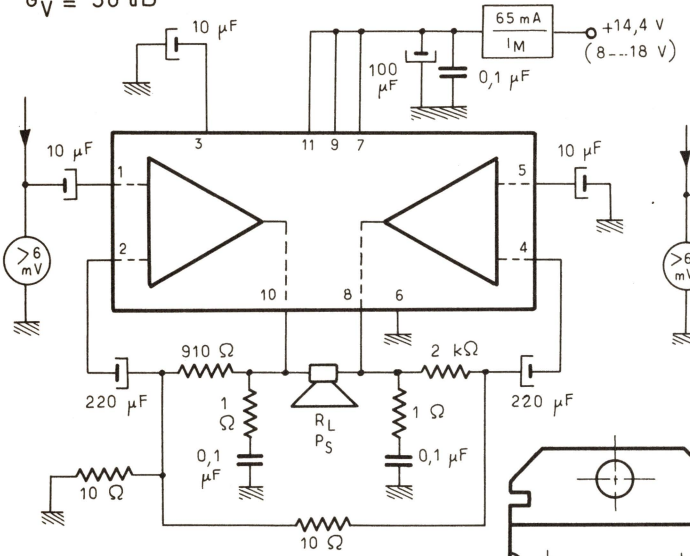
B.F. Puissance mono/stéréo , 6,5 à 22 W

Distorsion 0,3 % pour 2 × 6 W , R_L = 2 Ω

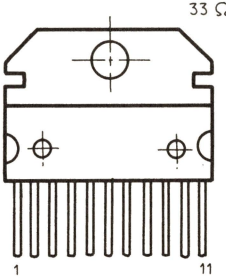
G_V = 50 dB

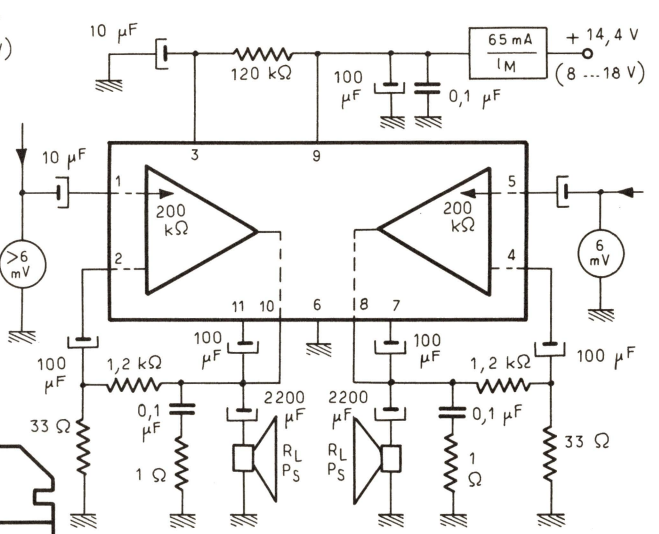
TDA 2004

SGS



R_L	4	3,2	Ω
P_S *	20	22	W
I_M	1	1,2	A





R_L	4	3,2	2	1,6	Ω
P_S *	6,5	8	10	11	W
I_M	0,6	0,8	1	1,2	A

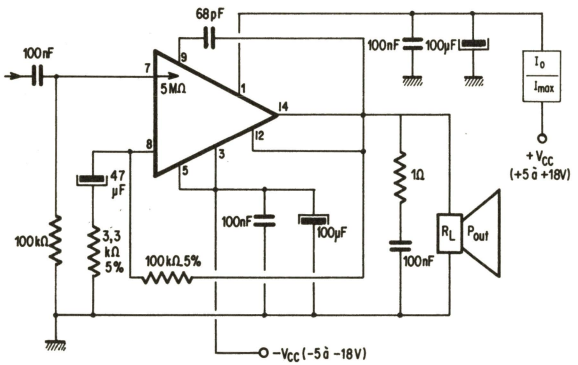
* Distorsion 10 %

B.F. Puissance 9 à 18 W

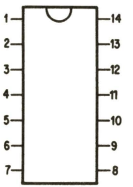
Gain en tension: 30 dB

TDA 2010
TDA 2020

SGS-Ates



	TDA 2010		TDA 2020	
± V_{CC} (V)	14	14	18	17
R_L (Ω)	8	4	8	4
P_{out} (W)*	9	12	16,5	18,5
I_o (mA)	45	45	60	60
I_{max} (A)	0,5	0,8	0,7	1



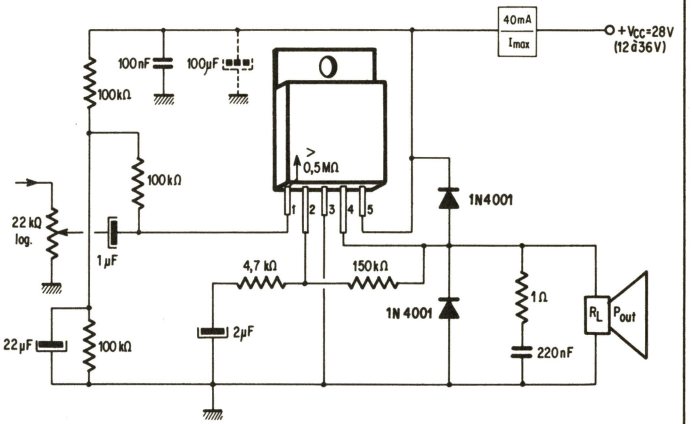
* Distorsion 1 %

B.F. Puissance 9 à 18 W

Gain en tension: 30 dB

TDA 2030

SGS-Ates



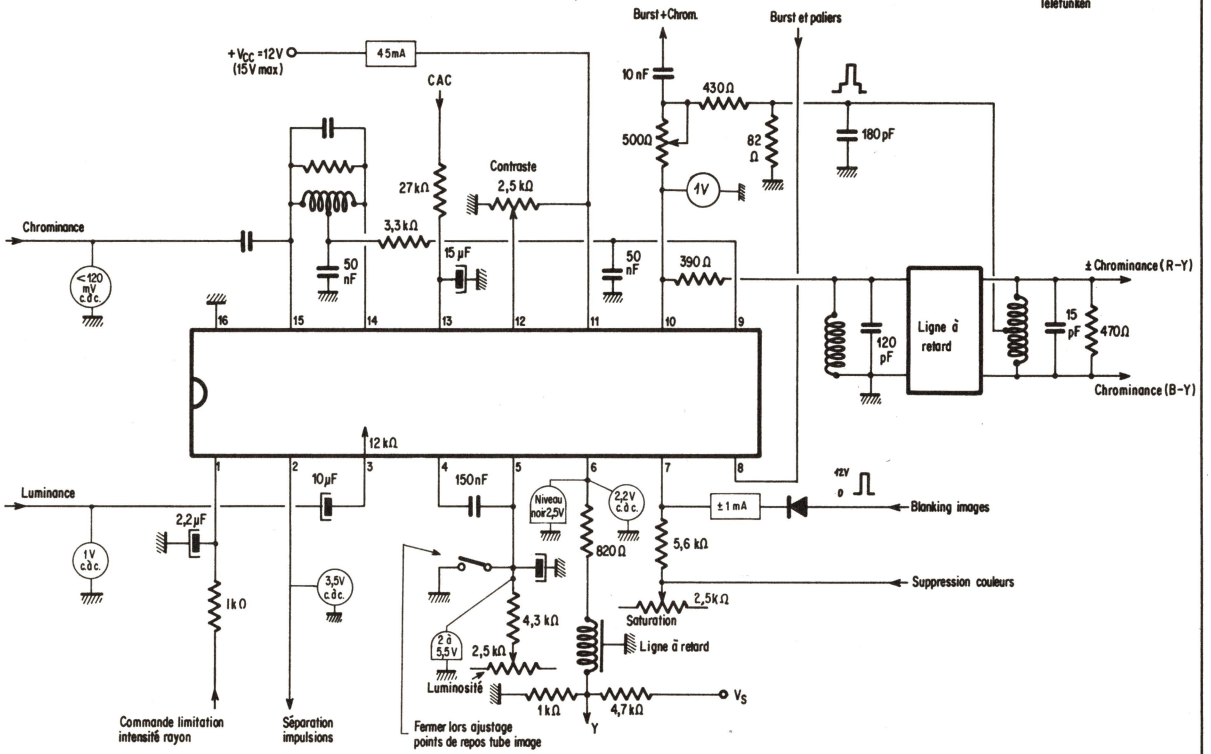
	Distorsion 10% à 1 kHz		Distorsion 0,5 % de 40Hz à 15kHz	
R_L (Ω)	8	4	8	4
P_{out} (W)	11	18	9	14
I_{max} (A)	0,7	1,1	0,52	0,9

Amplif. Luminance-Chrominance

C.A.C.:26 dB

TDA 2150

Telefunken



Démodulateur et matrice couleurs

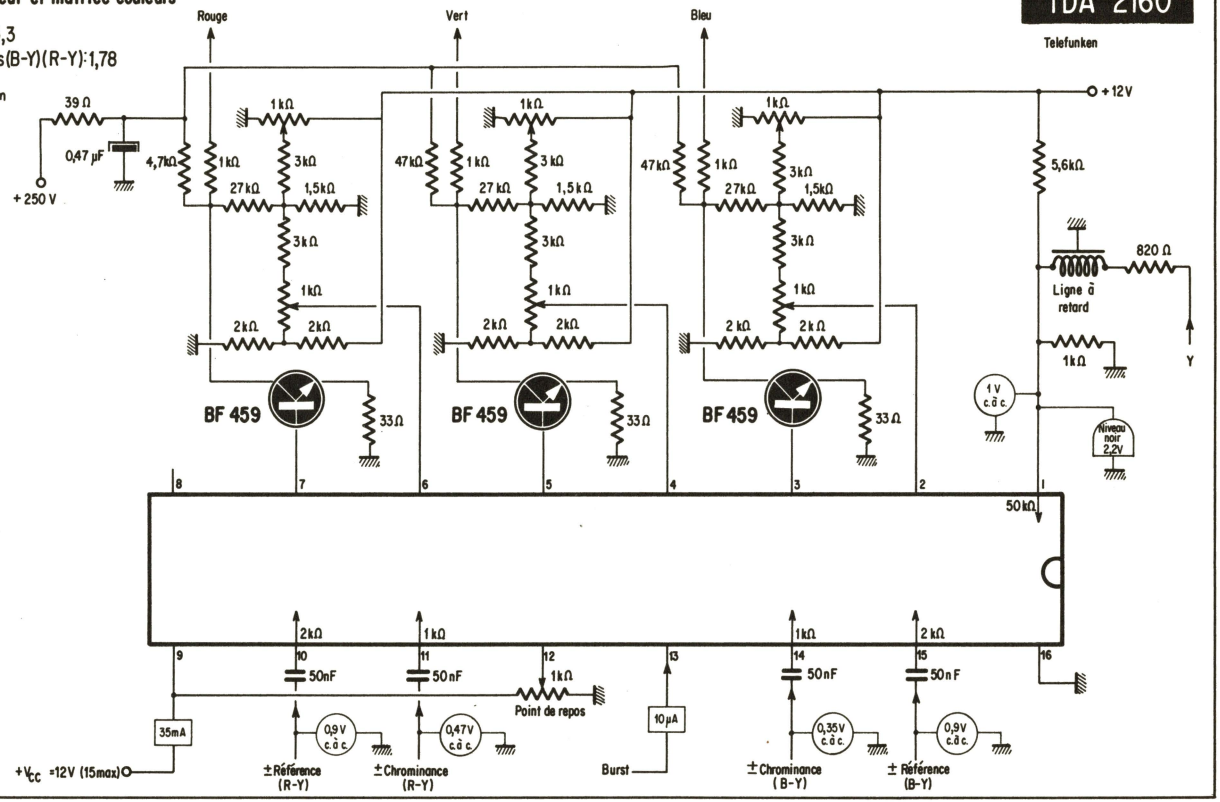
TDA 2160

Telefunken

Gain (R-Y): 3,3

Rapport gains (B-Y)(R-Y): 1,78

Démodulation synchrone



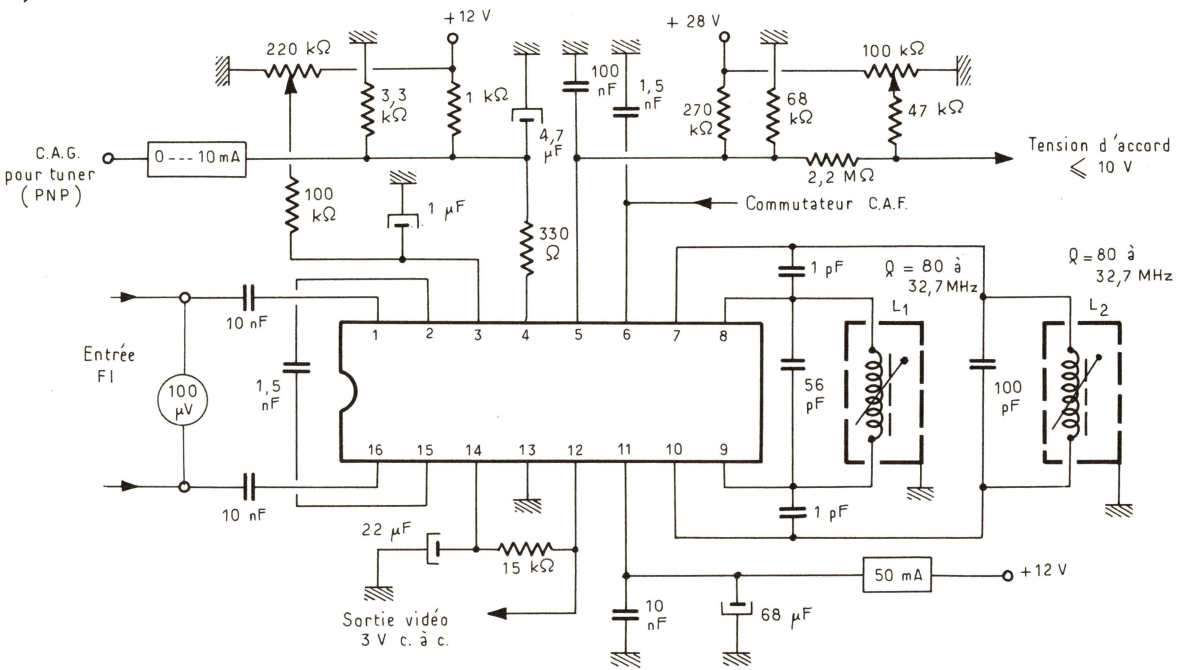
Amplif. - démodulateur F.I. - T.V.

CAG = 64 dB

Signal / bruit = 58 dB

TDA 2542

RTC



Oscillateur lignes TV

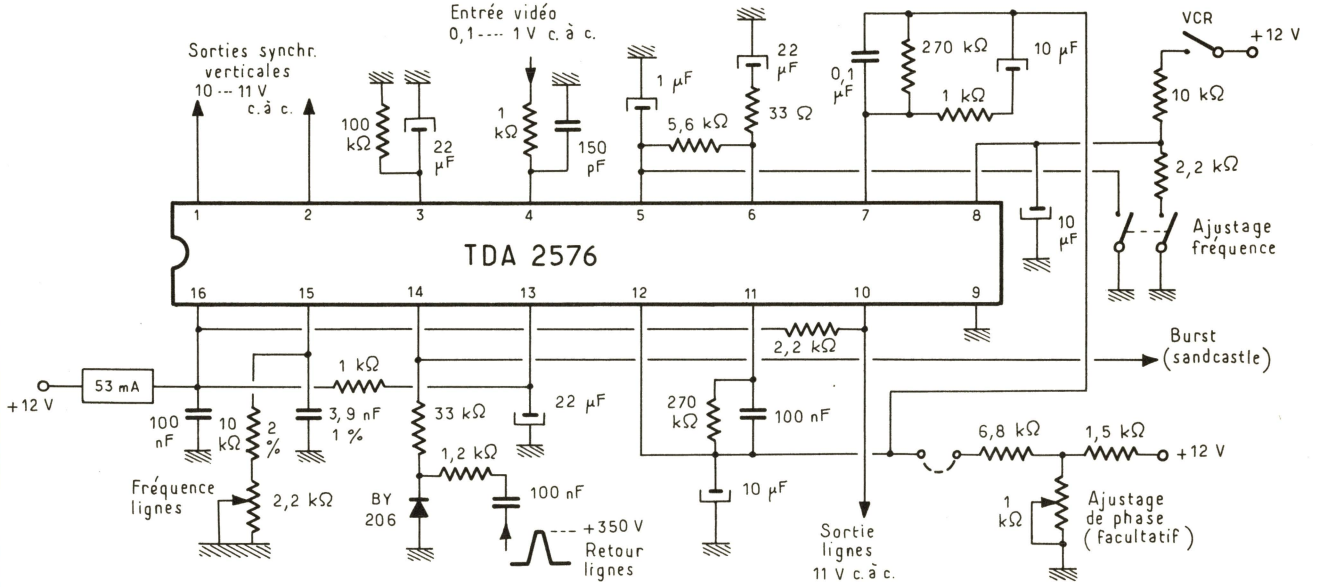
Avec diviseur vertical (1 : 625)

Plage maintien : ± 1 kHz

Plage capture : ± 0,9 kHz

TDA 2576

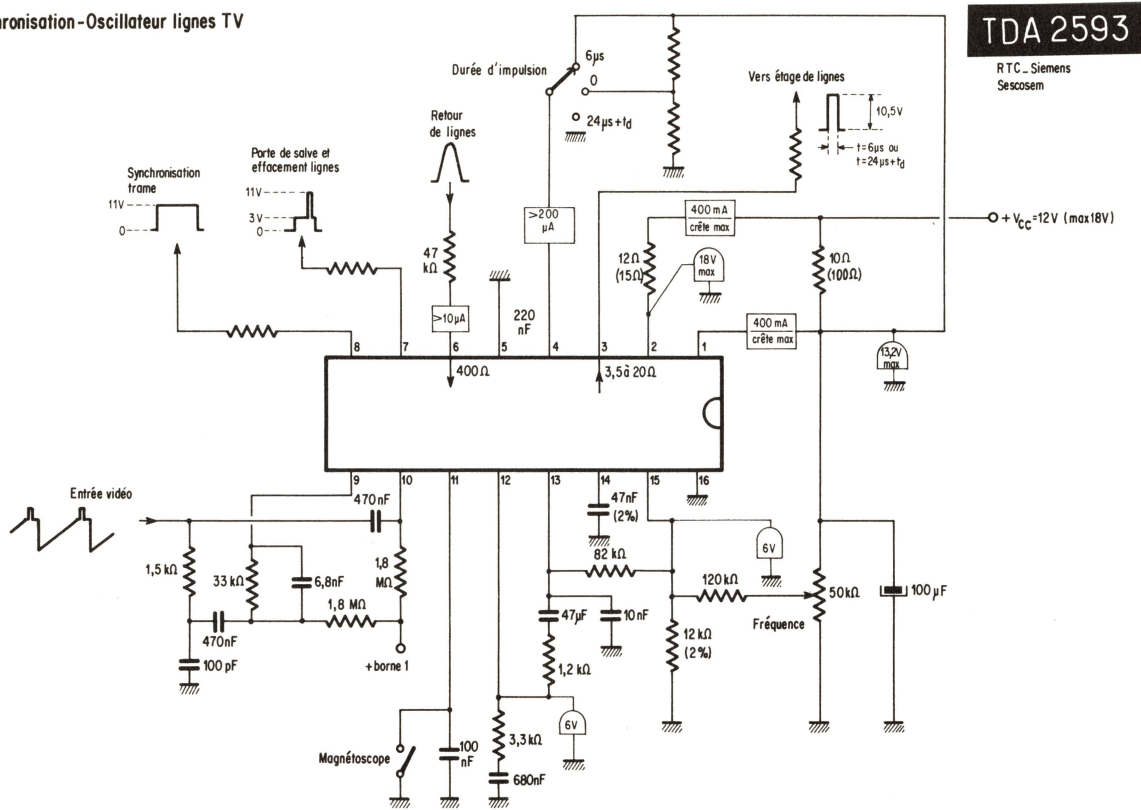
RTC



Séparateur - Synchronisation - Oscillateur lignes TV

TDA 2593

RTC _ Siemens
Sescosem

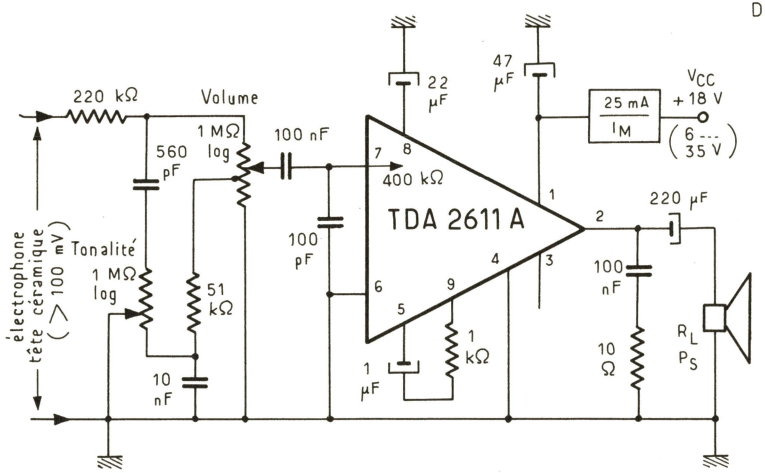


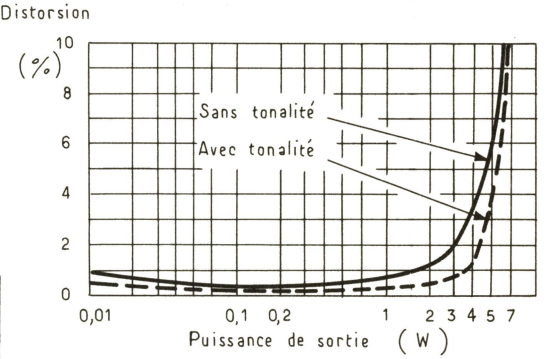
B.F. Puissance 5 W

Bruit en sortie < 0,5 mV

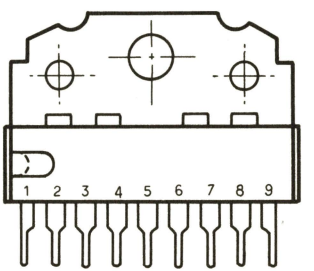
TDA 2611 A

RTC





R_L	8	8	8	8	15	Ω
V_{CC}	8,3	12	18	20	25	V
P_S	0,6	1,7	4	5	4,5	W
I_M	150	220	360	400	200	mA

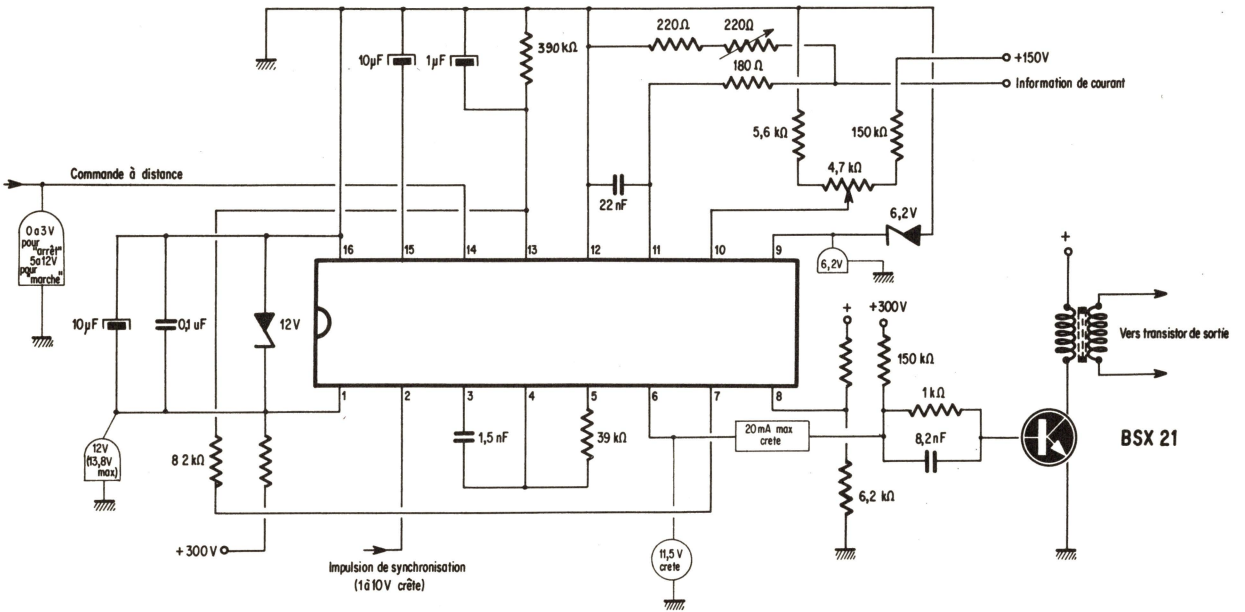


Commande alimentation à découpage

pour récepteur TV

TDA 2640

RTC



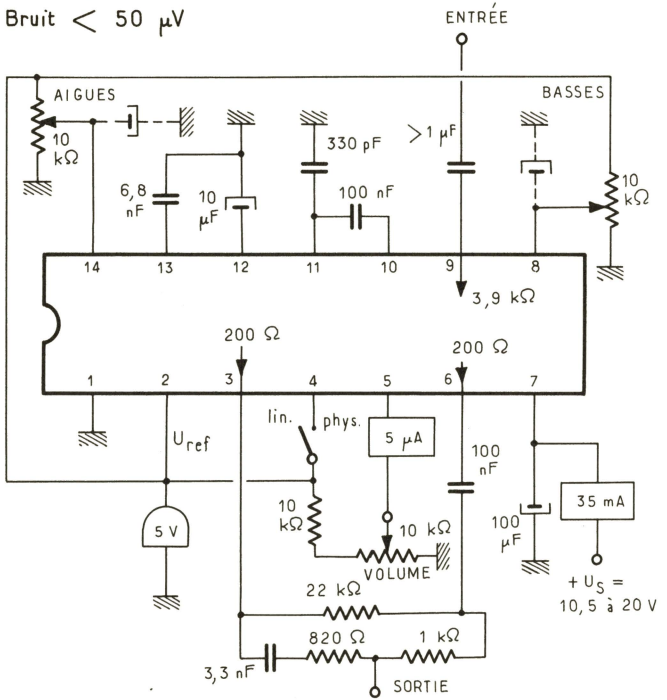
Commande Volume – Tonalité

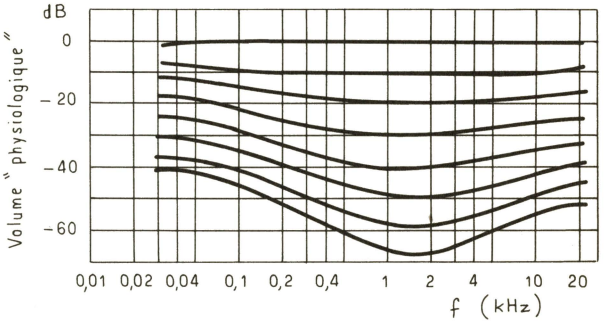
Gain $\leqslant$ 80 dB – Distorsion 0,2 %

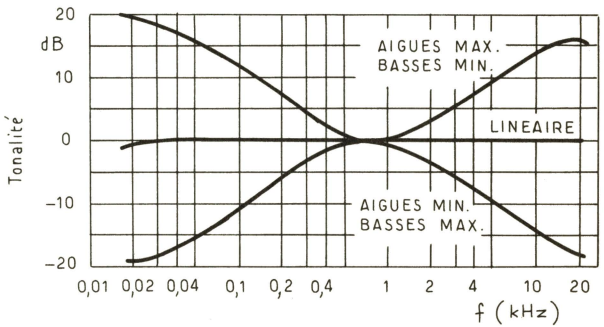
Bruit $<$ 50 µV

TDA 4290

Siemens





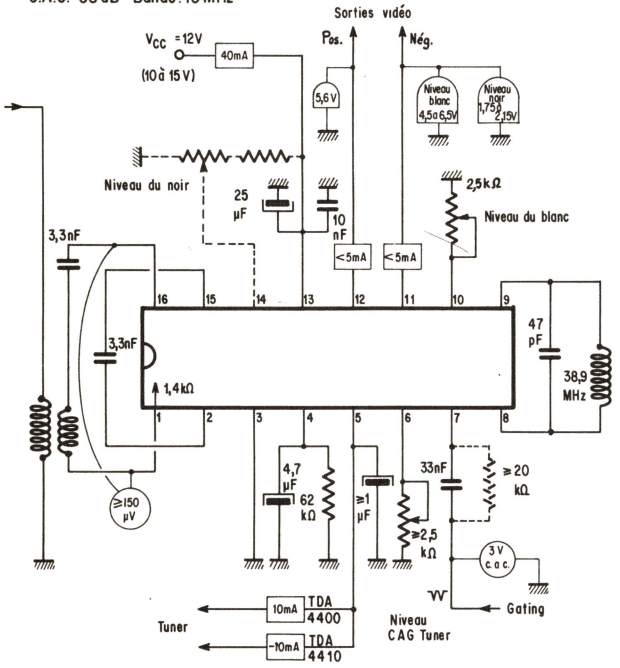


Amplif. F.I. et démodulateur TV

TDA 4400
TDA 4410

Telefunken

Tuners PNP : TDA 4400
Tuners NPN : TDA 4410
C.A.G. = 58 dB - Bande : 10 MHz

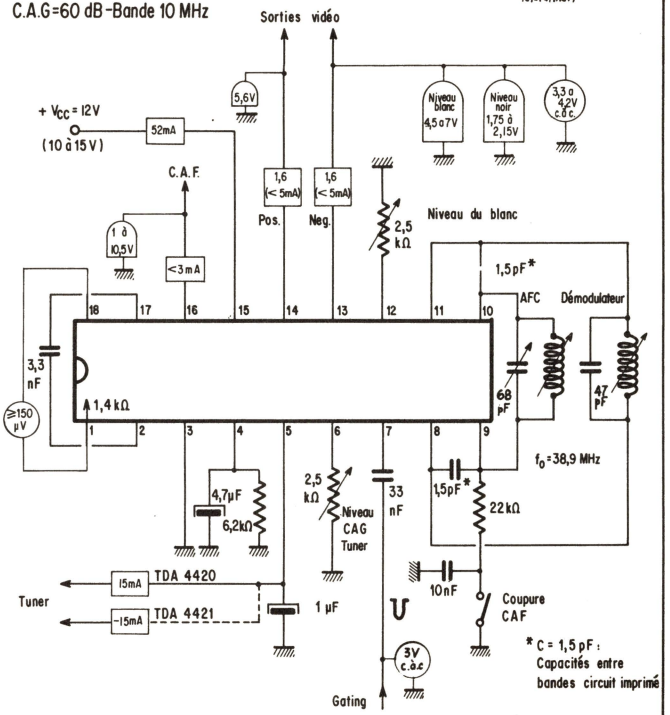


Amplif. F.I. et démodulateur TV_CAG et CAF

TDA 4420
TDA 4421

Telefunken

Tuners PNP : TDA 4420
Tuners NPN : TDA 4421
C.A.G = 60 dB - Bande 10 MHz



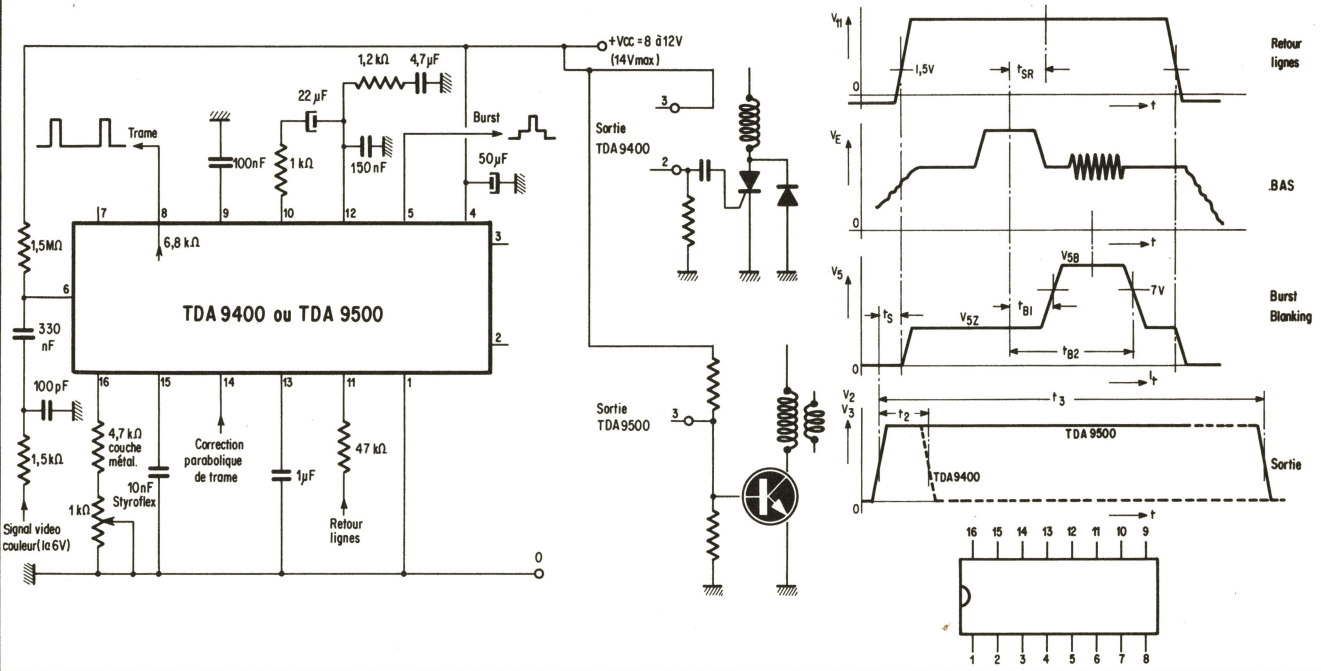
Séparation, synchronisation TV

Lignes

TDA 9400, TDA 9500

(Commande thyristor) (Commande transistor)

ITT

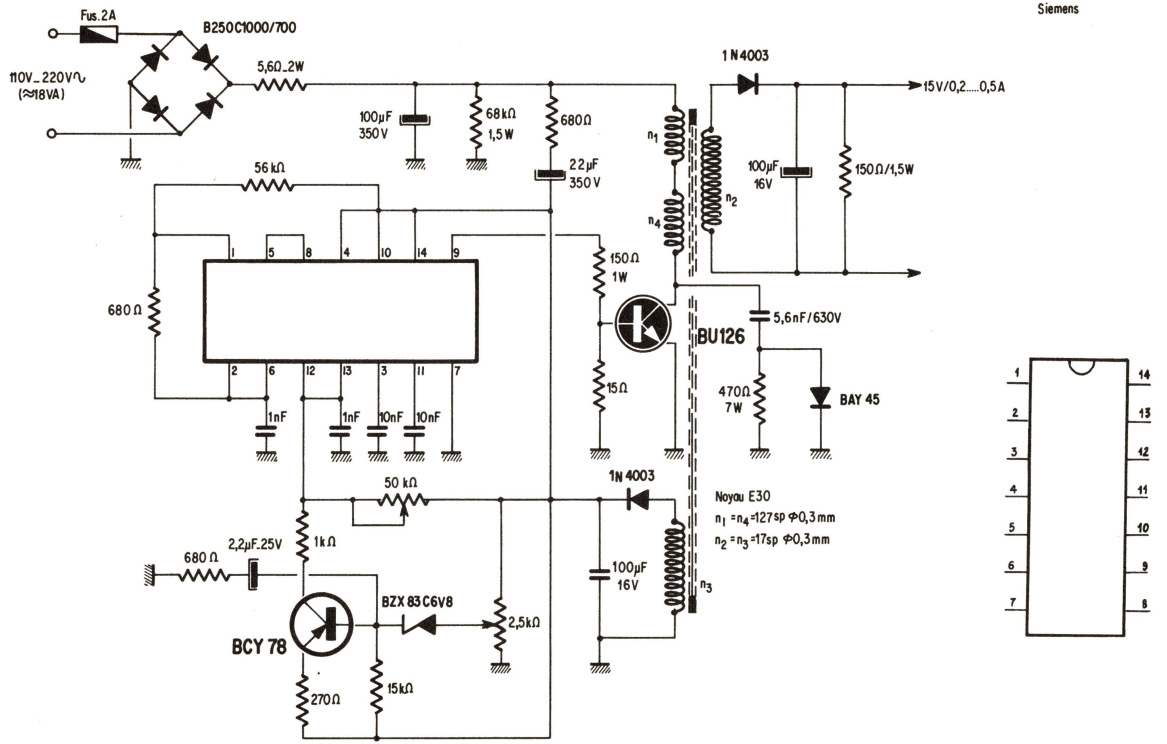


Alimentation à découpage

f≈16 kHz

TDB 0556 A

Siemens

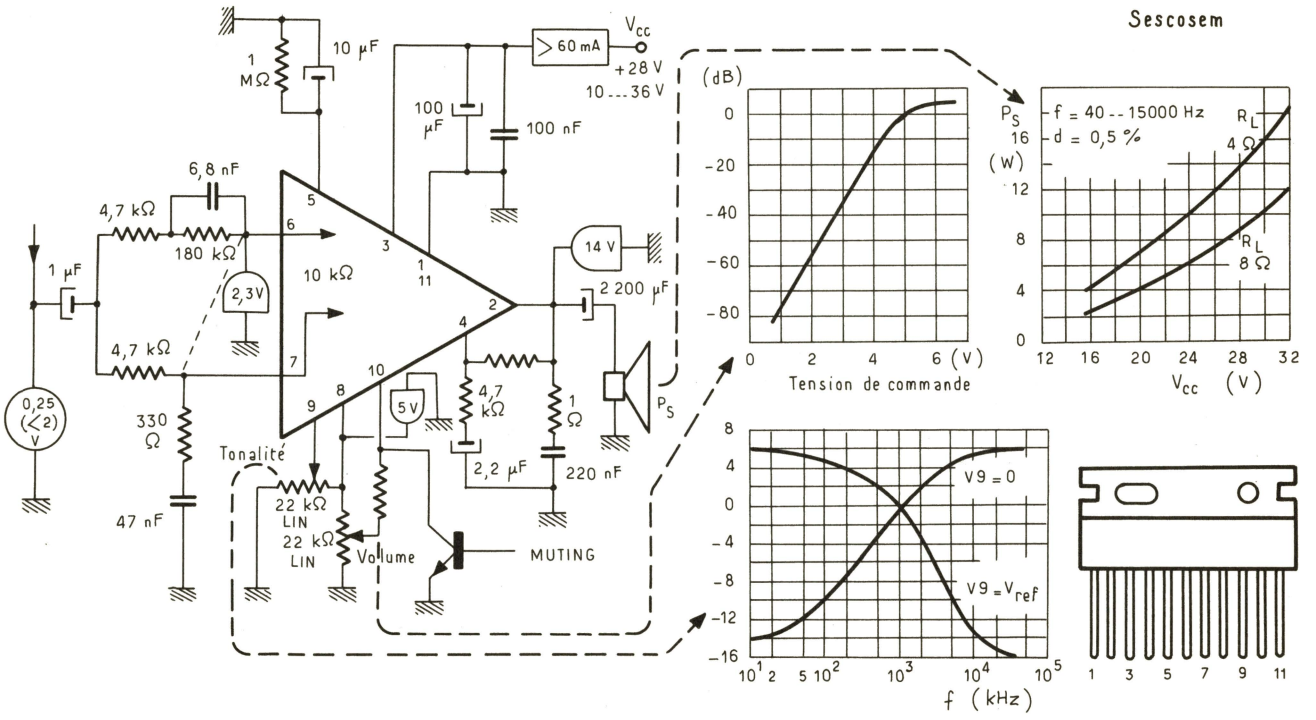


B.F. Puissance 2 à 18 W

Rapport signal / bruit > 60 dB

TEA 1022 SP

Sescosem

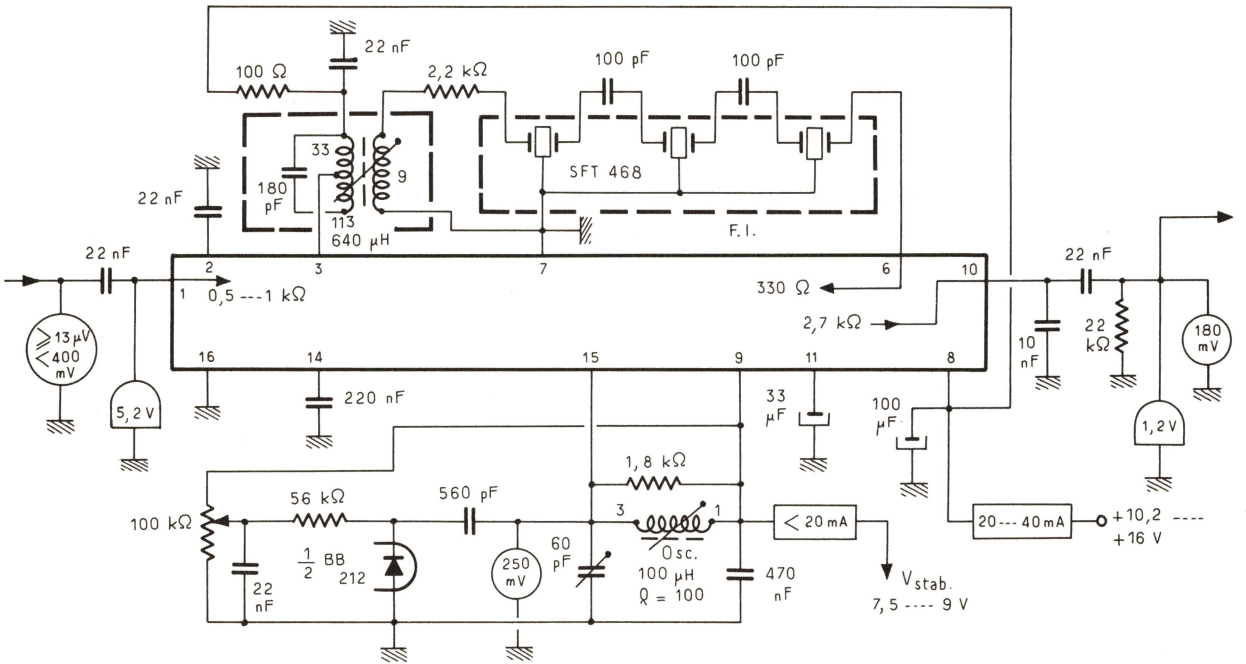


Réception AM - Autoradio

Distorsion < 2,5 %

TEA 5550

RTC



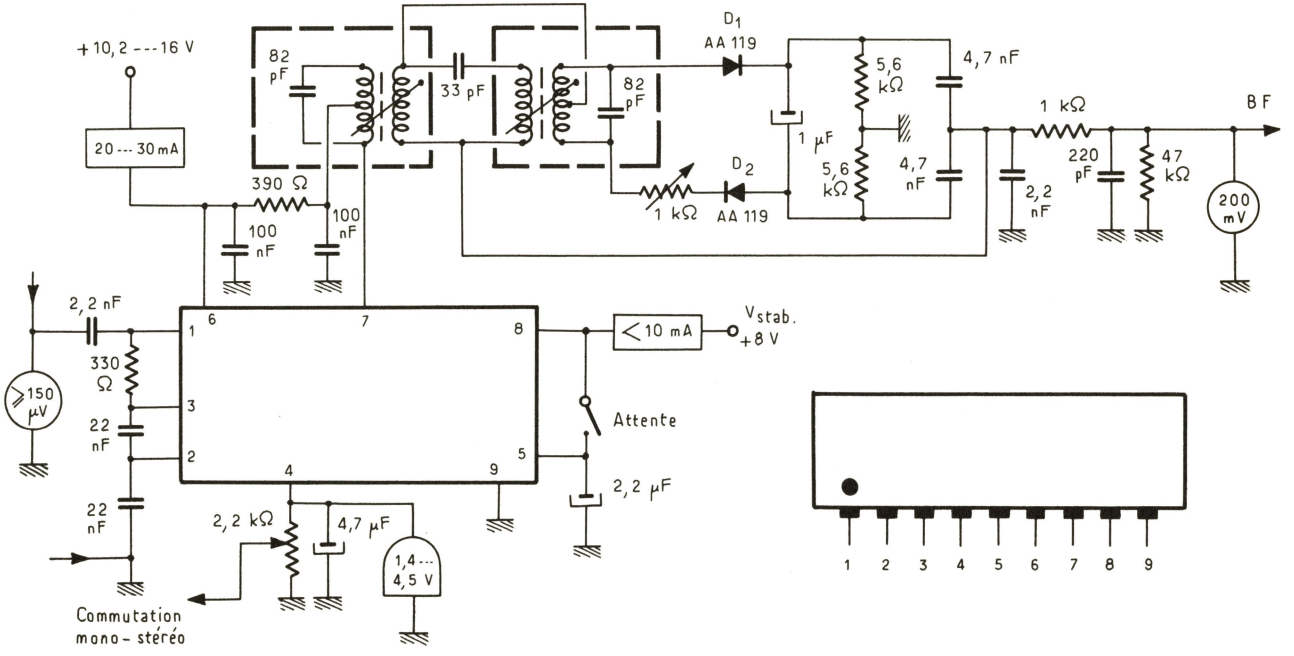
Réception F.M.

Distorsion 0,35 % à Δf = 22,5 kHz

Réjection AM : 50 dB

TEA 5560

RTC

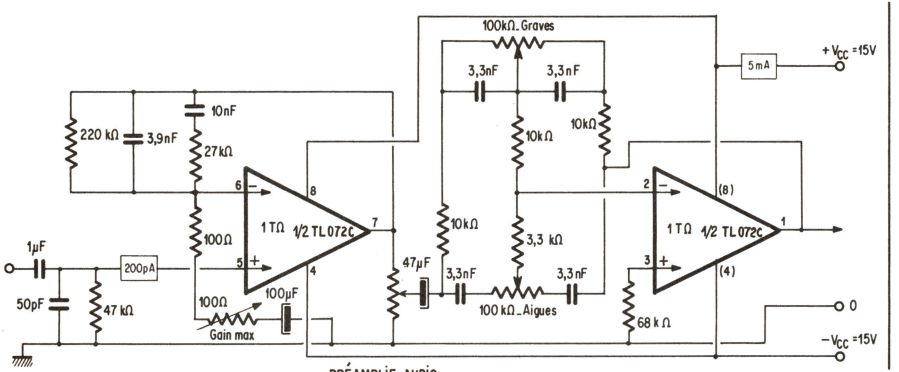


Amplif. opérationnel (Entrée FET)

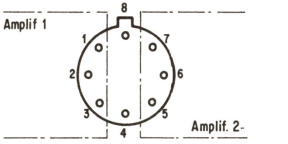
Bruit 18 nV/√Hz _ Distorsion 0,01 %
Offset 10 mV - 50 pA _ Gain ⩽15000

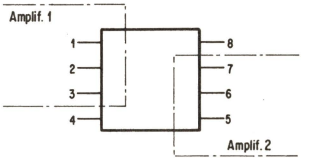
TL 071C - TL 072C

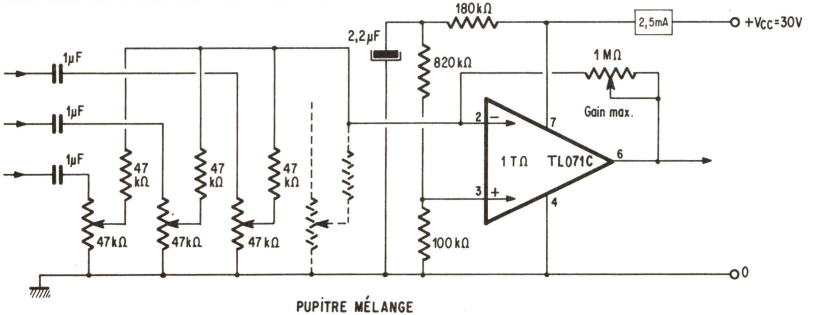
Texas Instruments



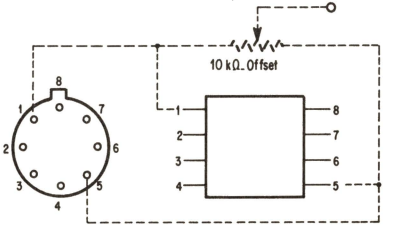
PRÉAMPLIF. AUDIO







PUPITRE MÉLANGE

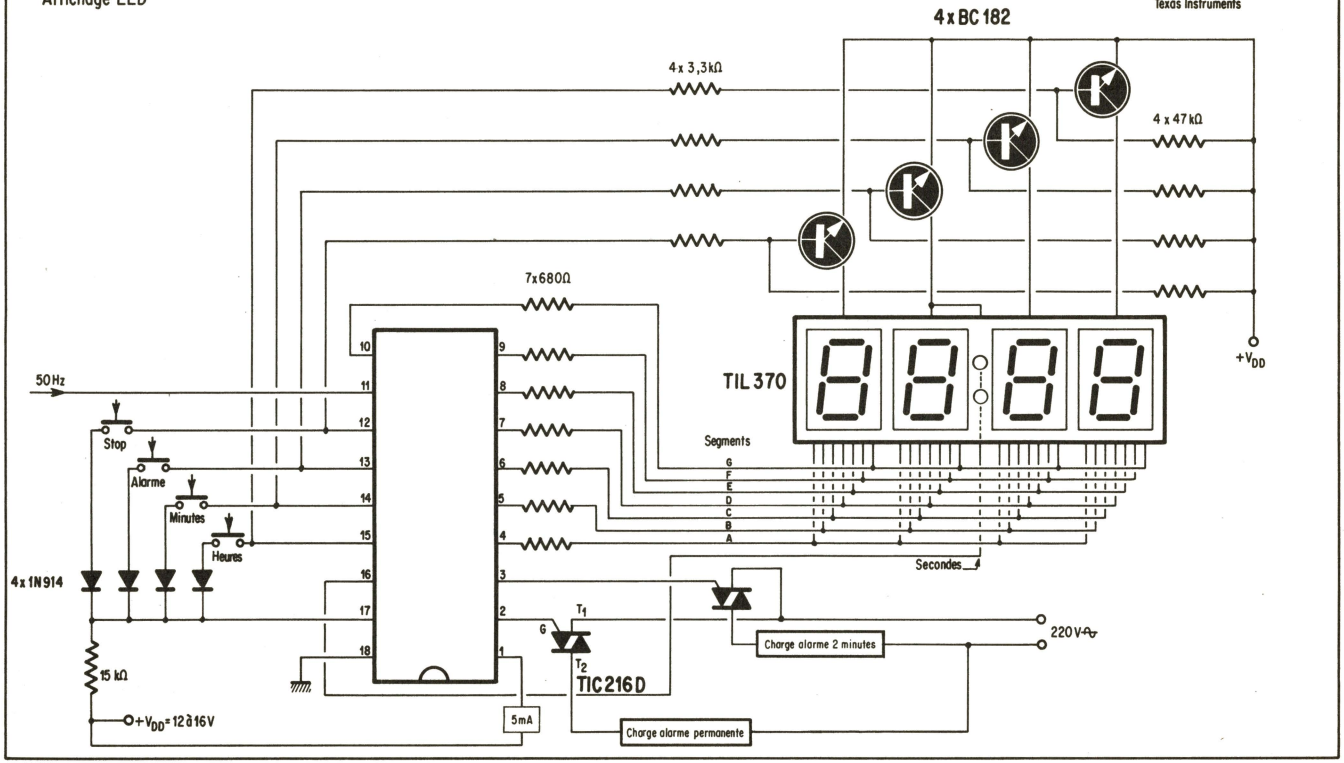


Horloge digitale

Affichage LED

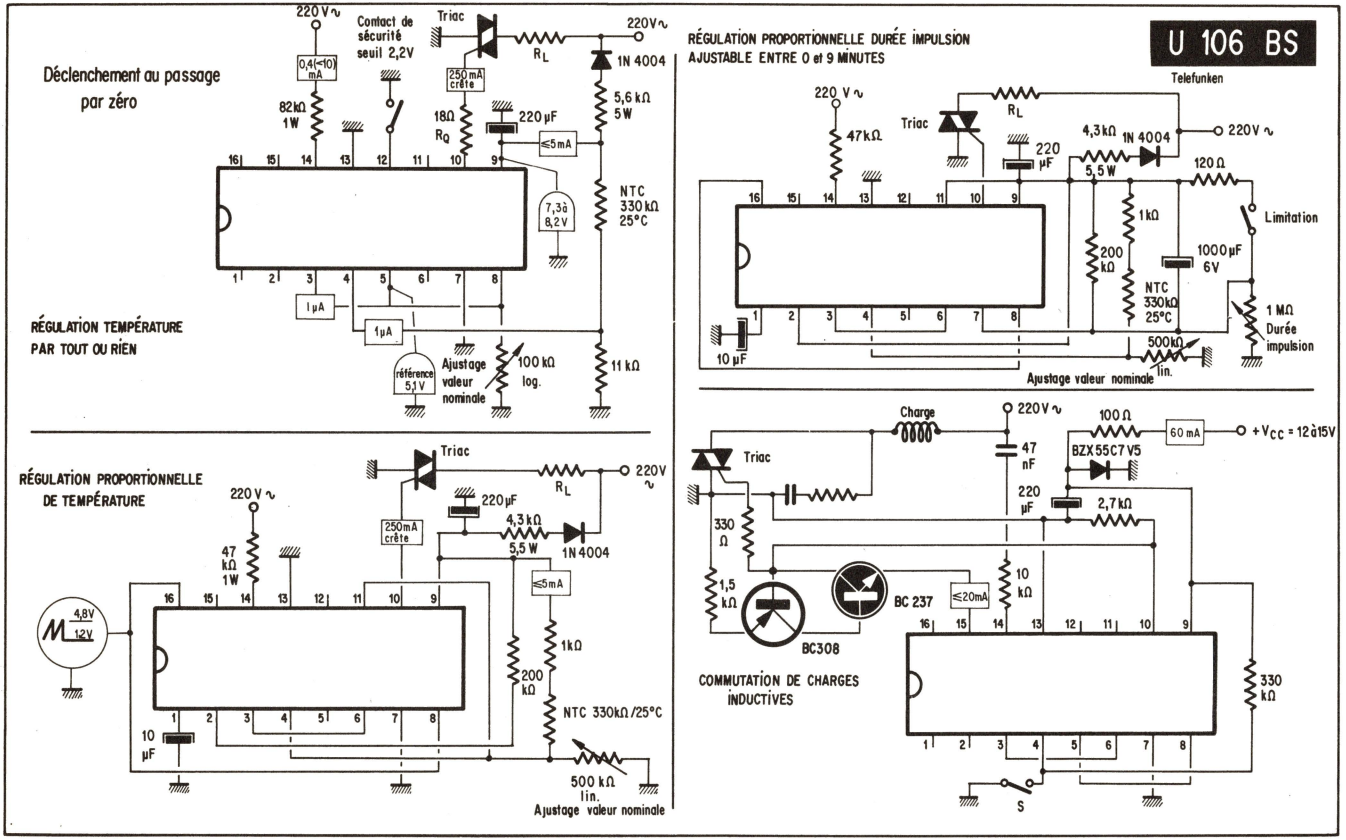
TMS 3874 NL

Texas Instruments



U 106 BS

Telefunken

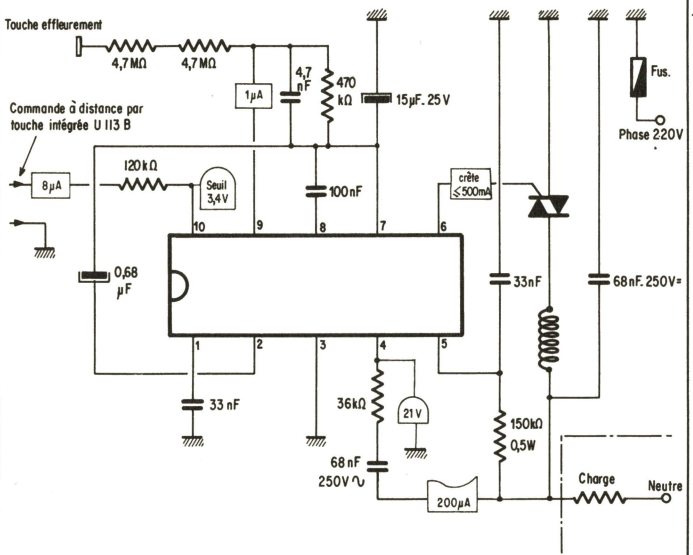


Commande Triac

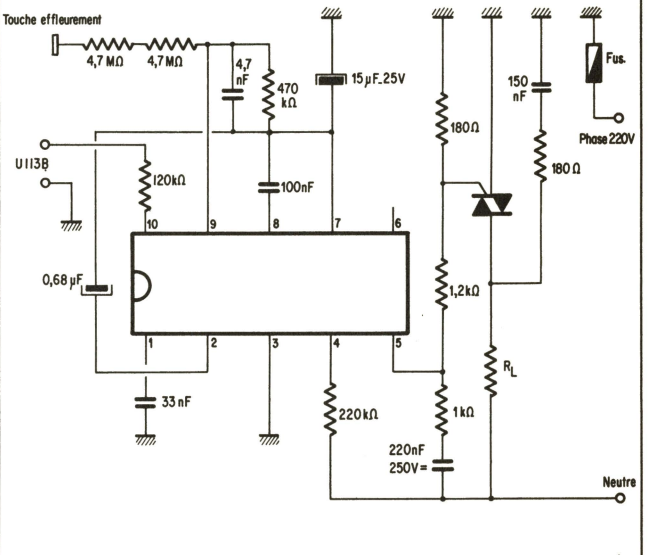
par touche effleurement
Commande par tout ou rien

U 112 BA

Telefunken



NEUTRE NON DISPONIBLE



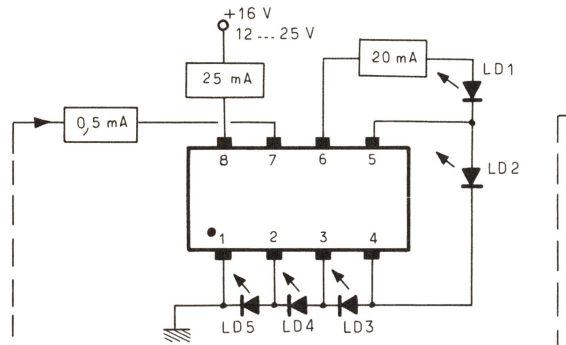
NEUTRE DISPONIBLE

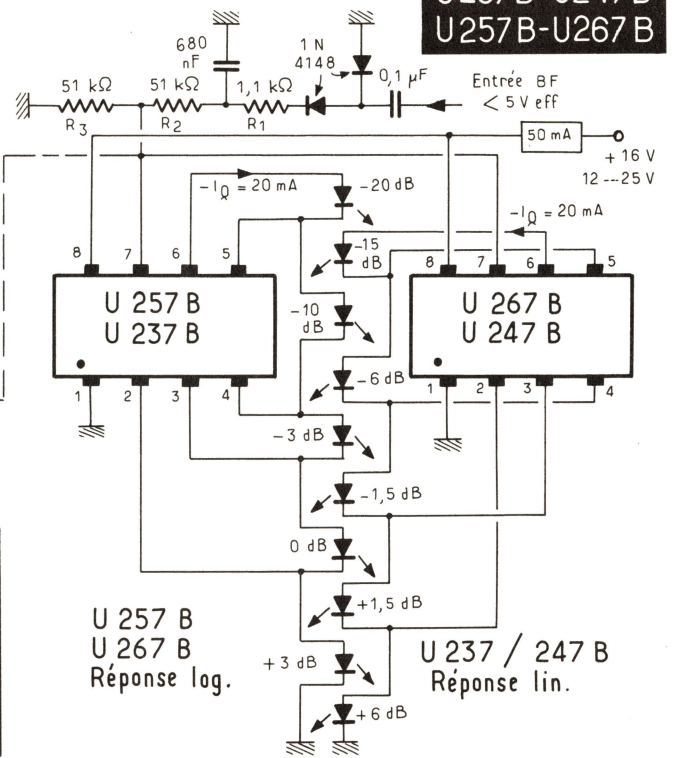
Indicateurs 5 / 10 LED

Point lumineux

AEG - Telefunken

U237B-U247B
U257B-U267B





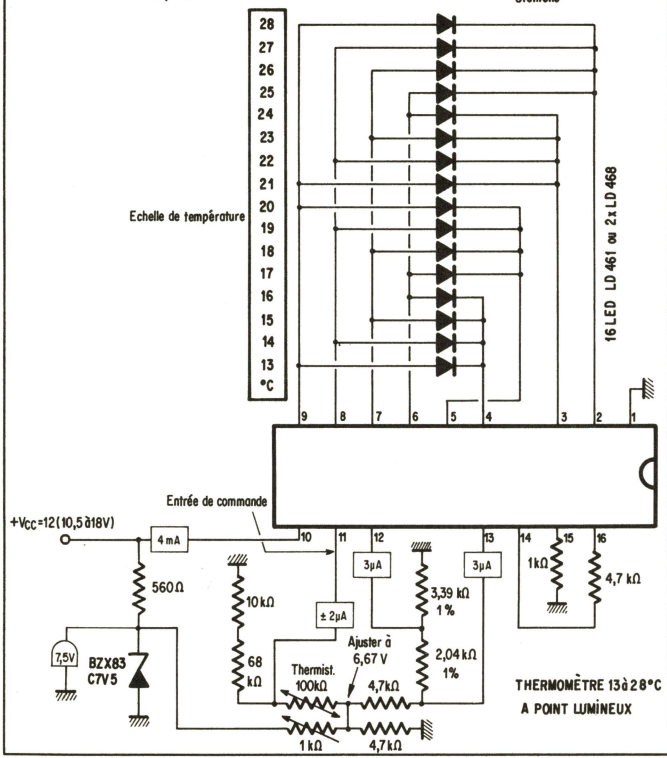
Tension de commande	LD 1	LD 2	LD 3	LD 4	LD 5	
U 237 B	0,2	0,4	0,6	0,8	1	V
U 247 B	0,1	0,3	0,5	0,7	0,9	V
U 257 B	0,18 = - 15	0,5 = - 6	0,84 = - 1,5	1,19 = + 1,5	2 = + 6	V dB
U 267 B	0,1 = - 20	0,32 = - 10	0,71 = - 3	1 = 0	1,41 = + 3	V dB

Indicateur 16 LED

Point lumineux (Spot)

UAA 170

Siemens



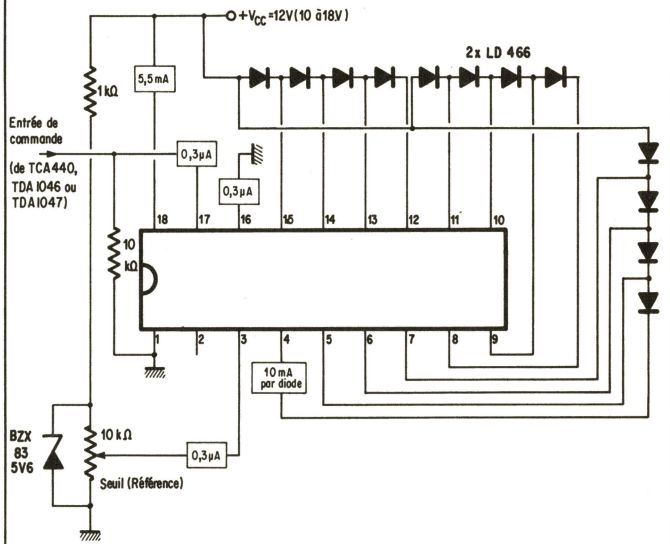
THERMOMÈTRE 13 à 28°C
A POINT LUMINEUX

Indicateur 12 LED

Bande lumineuse (Rampe)

UAA 180

Siemens

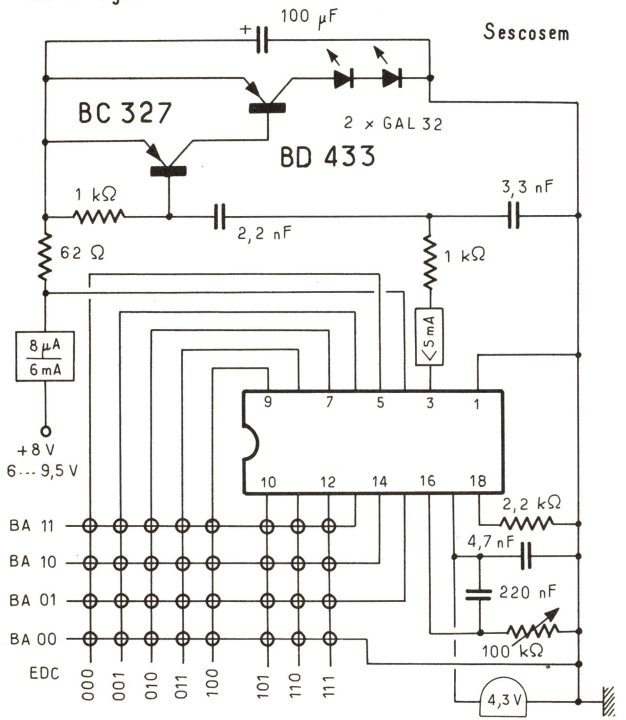


INDICATEUR D'ACCORD
A BANDE LUMINEUSE

Télécommande TV Infrarouges

UAA 4000

Sescosem

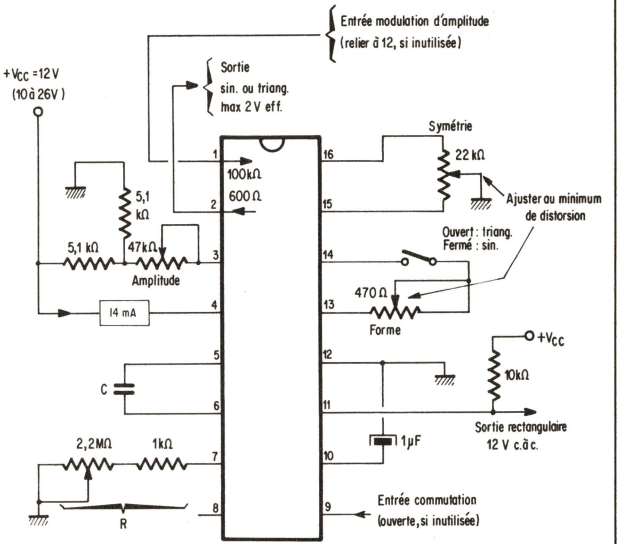


Générateur fonctions 0,01 Hz à 1 MHz

Distorsion : < 0,5%
Rapport de gamme ≤ 2000

XR 2206

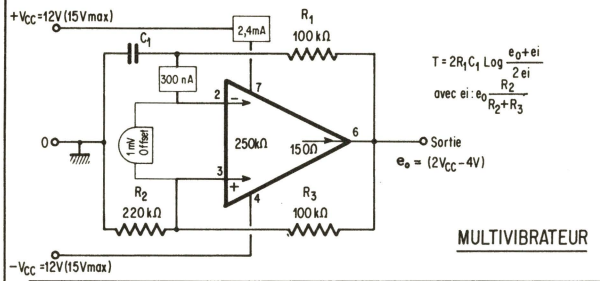
Exar



f = 1 / RC

Amplif. opérationnel

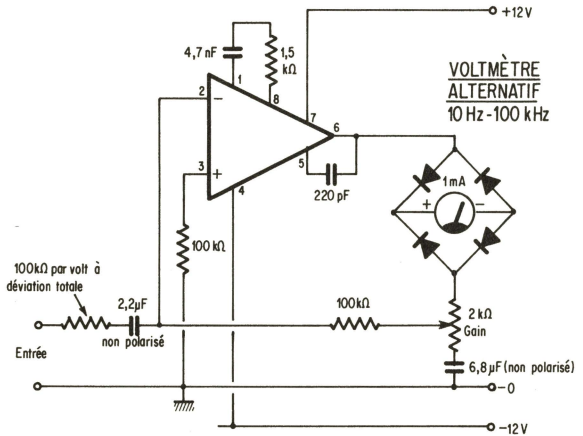
Gain : 86 dB



$T = 2R_1C_1 \text{ Log } \frac{e_o + ei}{2ei}$

avec $ei : e_o \frac{R_2}{R_2 + R_3}$

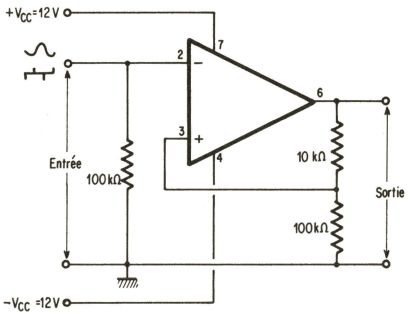
MULTIVIBRATEUR



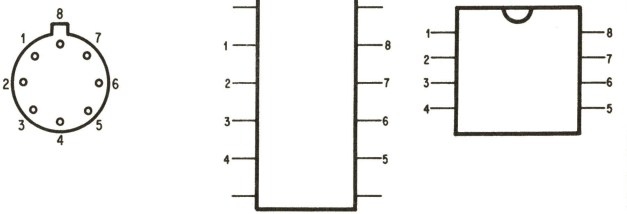
VOLTMÈTRE ALTERNATIF
10 Hz - 100 kHz

µA 709

Fairchild
= MC 1709 Motorola
= SN 72709 Texas Instruments
= SFC 2709 C Sescosem
= TAA 521 Siemens
= LM 709 National Semicond.



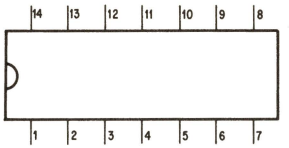
TRIGGER

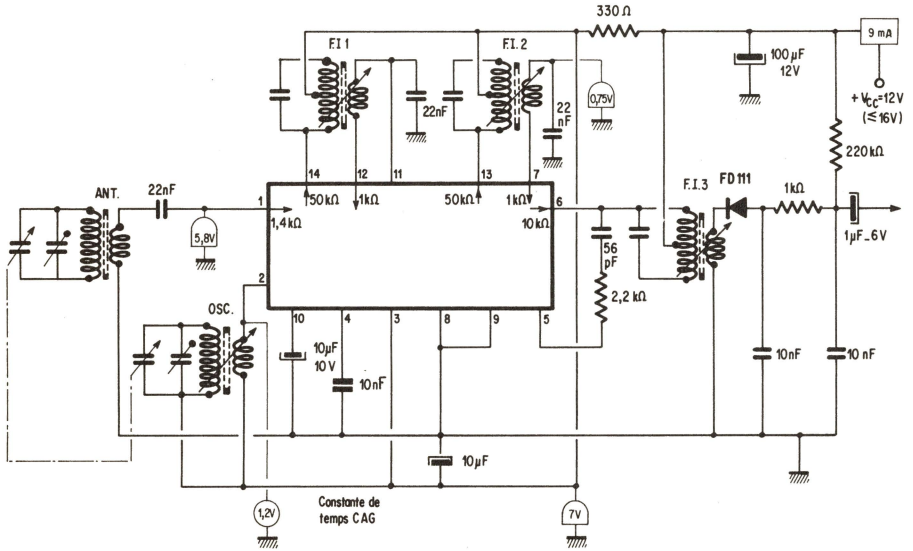


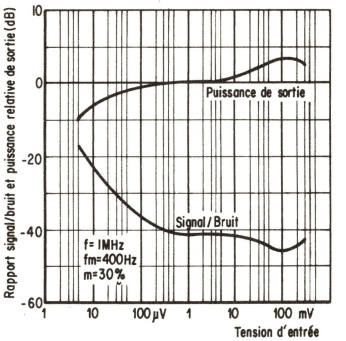
Radioréception A.M.

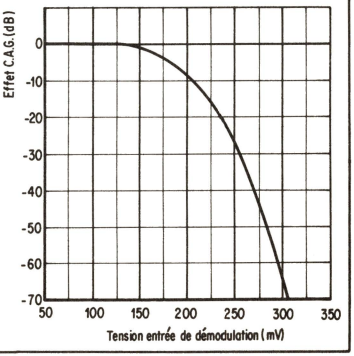
µA 720

Fairchild









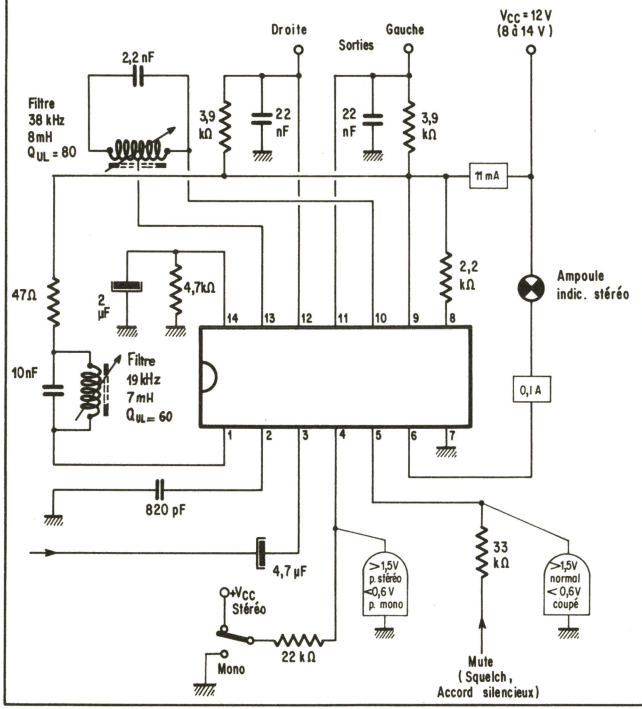
Décodeur stéréo

µA 732

Fairchild

Séparation canaux : 40 dB

Distorsion : 0,5 %

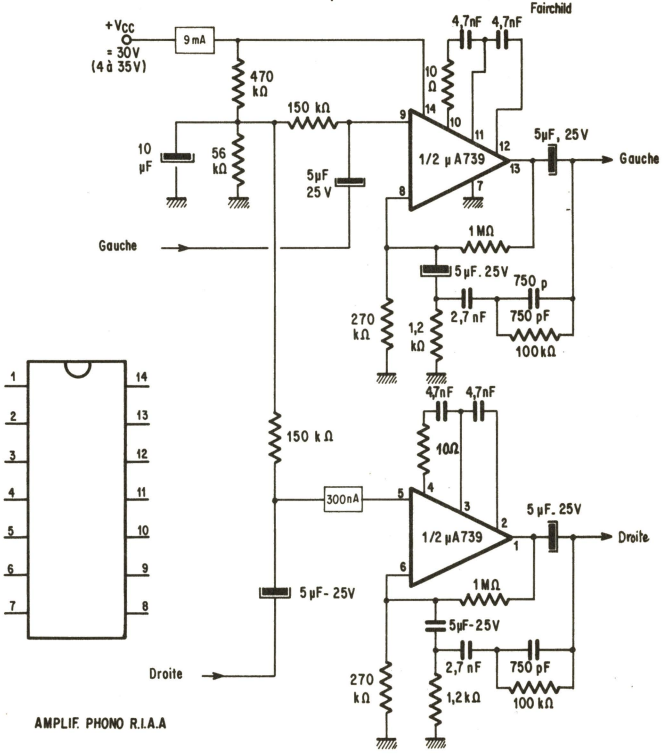


Préamplif. double

µA 739

Fairchild

Stéréo_Bruit<10 nV/ √Hz_Facteur bruit 2 dB_Sépar. canaux:140 dB



Amplif. opérationnel

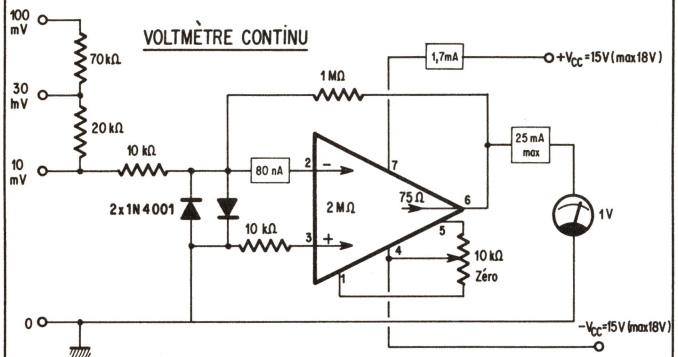
Gain : 200 000 (106 dB)_Offset 1mV_20 nA

µA 741 C

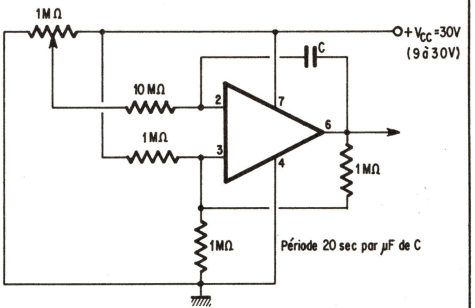
Fairchild

= SN 72741 Texas Instruments
= SFC 2741 Sescosem
= TBA 221 Siemens
= LM 741 National Semicond.
= MC1741 Motorola
= CA 741 RCA
= N 5741 RTC-Signetics

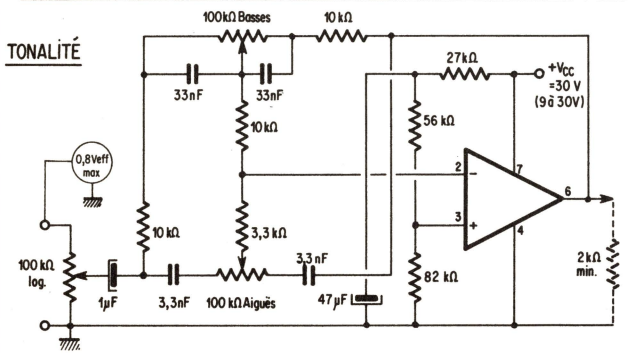
VOLTMÈTRE CONTINU

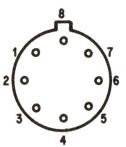


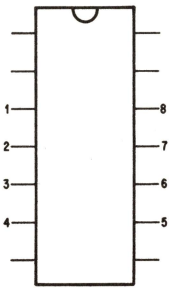
MULTIVIBRATEUR LENT

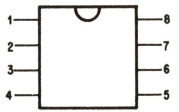


TONALITÉ







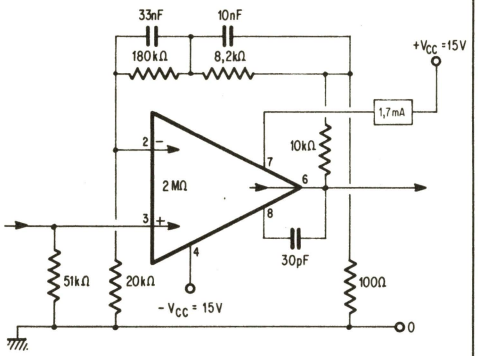


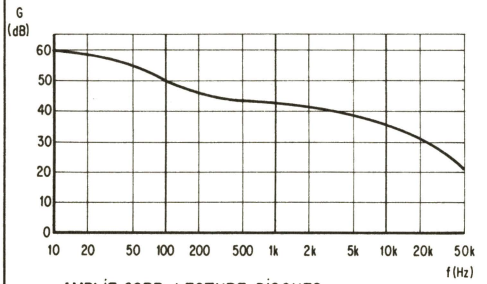
Amplif. opérationnel

(= µA 741, sauf compensation externe)

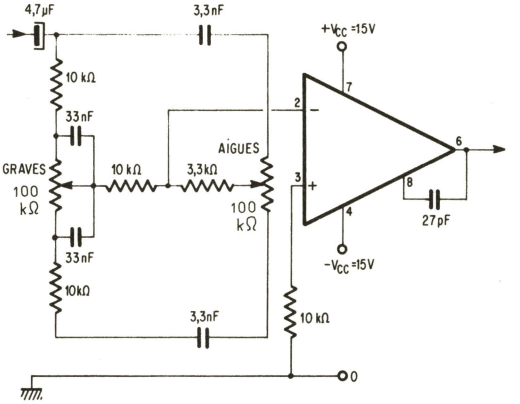
µA 748 C

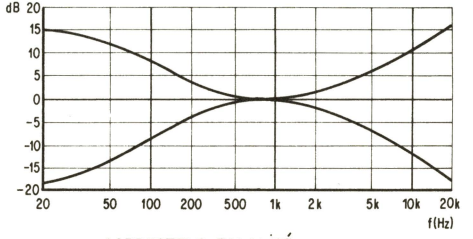
Fairchild
=SN 72748 Texas Instr.
=LM 748 National Semicond.
=CA 748C R.C.A.
=SFC 2748 Sescosem
=N 5748 RTC - Signetics



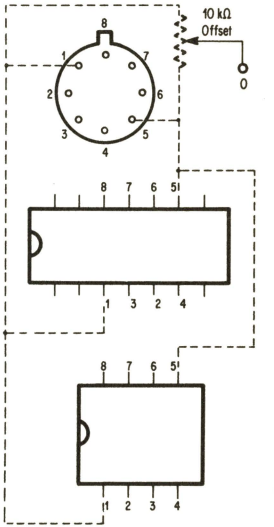


AMPLIF. CORR. LECTURE DISQUES





CORRECTEUR TONALITÉ

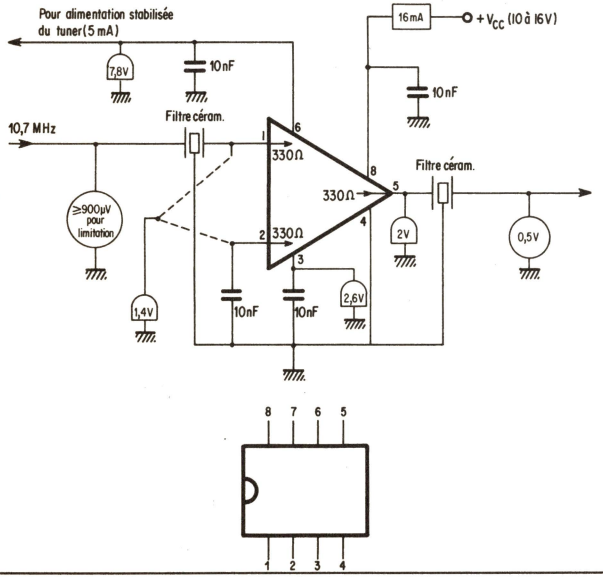


Amplif. F.I-F.M.

Gain : 50 dB

µA 753

Fairchild

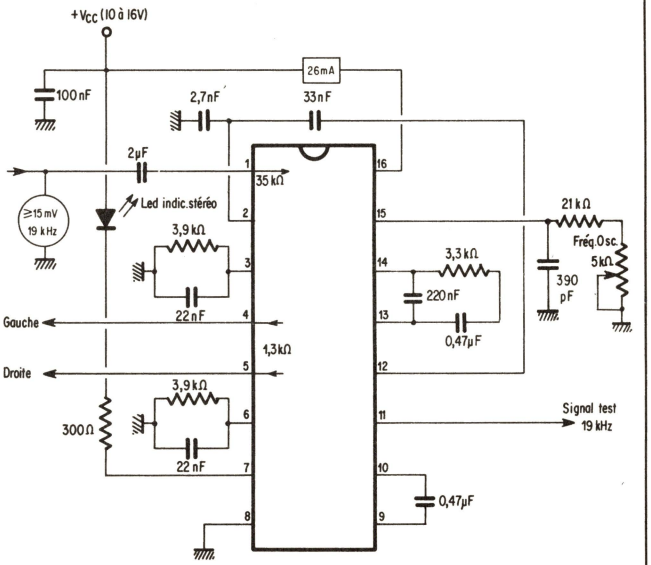


Décodeur stéréo

à verrouillage de phase
Séparation canaux : 40 dB
Distorsion : 0,4 %

µA 758

Fairchild
RTC_Signetics
=CA 758 R.C.A.



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